**Main Criteria:** Forward Education

**Secondary Criteria:** Alabama Courses of Study, Alaska Content and Performance Standards, Arizona's College and Career Ready Standards, Arkansas Standards, California Content Standards, Colorado Academic Standards (CAS), Connecticut State Standards, Delaware Standards and Instruction, Florida Standards, Georgia Standards of Excellence, Hawaii Content and Performance Standards

**Subjects:** Mathematics, Science, Technology Education

**Grades:** 7, 8

# Forward Education

Harnessing the Sun's Energy with Solar Panels

**Alabama Courses of Study**

**Mathematics**

Grade **7** - Adopted: **2019/Impl. 2020**

| STRAND / DOMAIN | | Mathematical Practices |
|---|---|---|
| OBJECTIVE / CATEGORY | MP1 | Make sense of problems and persevere in solving them. |
| OBJECTIVE / CATEGORY | MP2 | Reason abstractly and quantitatively. |
| OBJECTIVE / CATEGORY | MP3 | Construct viable arguments and critique the reasoning of others. |
| OBJECTIVE / CATEGORY | MP4 | Model with mathematics. |
| OBJECTIVE / CATEGORY | MP6 | Attend to precision. |
| OBJECTIVE / CATEGORY | MP7 | Look for and make use of structure. |

**Alabama Courses of Study**

**Mathematics**

Grade **8** - Adopted: **2019/Impl. 2020**

| STRAND / DOMAIN | | Mathematical Practices |
|---|---|---|
| OBJECTIVE / CATEGORY | MP1 | Make sense of problems and persevere in solving them. |
| OBJECTIVE / CATEGORY | MP2 | Reason abstractly and quantitatively. |
| OBJECTIVE / CATEGORY | MP3 | Construct viable arguments and critique the reasoning of others. |
| OBJECTIVE / CATEGORY | MP4 | Model with mathematics. |
| OBJECTIVE / CATEGORY | MP6 | Attend to precision. |

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| OBJECTIVE / CATEGORY | MP7 | Look for and make use of structure. |

**Alabama Courses of Study**

**Science**

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

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|---|---|---|
| **STRAND / DOMAIN** | **AL.RH.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **OBJECTIVE / CATEGORY** | | **Key Ideas and Details** |
| STANDARD | RH.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 | RH.6-8.3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |

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| **STRAND / DOMAIN** | **AL.RH.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **OBJECTIVE / CATEGORY** | | **Craft and Structure** |
| STANDARD | RH.6-8.4. | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to Grades 6-8 texts and topics. |
| STANDARD | RH.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. |

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| **STRAND / DOMAIN** | **AL.RH.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **OBJECTIVE / CATEGORY** | | **Integration of Knowledge and Ideas** |
| STANDARD | RH.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. |

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|---|---|---|
| **STRAND / DOMAIN** | **AL.RH.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **OBJECTIVE / CATEGORY** | | **Range of Reading and Level of Text Complexity** |
| STANDARD | RH.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. |

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

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

**Alabama Courses of Study**

**Science**

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

| STRAND / DOMAIN | AL.RH.6-8. | Reading Standards for Literacy in Science and Technical Subjects |
|---|---|---|
| OBJECTIVE / CATEGORY | | Key Ideas and Details |
| STANDARD | RH.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 | RH.6-8.3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |

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

| STRAND / DOMAIN | AL.RH.6-8. | Reading Standards for Literacy in Science and Technical Subjects |
|---|---|---|
| OBJECTIVE / CATEGORY | | Integration of Knowledge and Ideas |
| STANDARD | RH.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 / DOMAIN | AL.RH.6-8. | Reading Standards for Literacy in Science and Technical Subjects |
|---|---|---|
| OBJECTIVE / CATEGORY | | Range of Reading and Level of Text Complexity |
| STANDARD | RH.6-8.10. | By the end of Grade 8, read and comprehend science/technical texts in the Grades 6-8 text complexity band independently and proficiently. |

| STRAND / DOMAIN | AL.WHST.6-8. | Writing Standards for Literacy in Science, and Technical Subjects |
|---|---|---|

| | | |
|---|---|---|
| **OBJECTIVE / CATEGORY** | | **Text Types and Purposes** |
| **STANDARD** | **WHST.6-8.2.** | **Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** |
| RELATED CONTENT / EXPECTATION | WHST.6-8.2.d. | Use precise language and domain-specific vocabulary to inform about or explain the topic. |

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

**Alabama Courses of Study**

**Technology Education**

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

| | | |
|---|---|---|
| **STRAND / DOMAIN** | **AL.DLCS.7.** | **Digital Literacy and Computer Science** |
| **OBJECTIVE / CATEGORY** | **7.1.** | **Computational Thinker** |
| **STANDARD** | | **Algorithms** |
| RELATED CONTENT / EXPECTATION | 7.1.3. | Create algorithms that demonstrate sequencing, selection or iteration. |
| RELATED CONTENT / EXPECTATION | 7.1.4. | Design a complex algorithm that contains sequencing, selection or iteration. |

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| **STRAND / DOMAIN** | **AL.DLCS.7.** | **Digital Literacy and Computer Science** |
| **OBJECTIVE / CATEGORY** | **7.1.** | **Computational Thinker** |
| **STANDARD** | | **Programming and Development** |
| RELATED CONTENT / EXPECTATION | 7.1.5. | Solve a complex problem using computational thinking. |
| RELATED CONTENT / EXPECTATION | 7.1.6. | Create and organize algorithms in order to automate a process efficiently. |

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| **STRAND / DOMAIN** | **AL.DLCS.7.** | **Digital Literacy and Computer Science** |

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|---|---|---|
| **OBJECTIVE / CATEGORY** | **7.5.** | **Innovative Designer** |
| **STANDARD** | | **Design Thinking** |
| RELATED CONTENT / EXPECTATION | 7.5.30. | Apply the problem-solving process to solve real-world problems. |

**Alabama Courses of Study**

**Technology Education**

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

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|---|---|---|
| **STRAND / DOMAIN** | **AL.DLCS.8.** | **Digital Literacy and Computer Science** |
| **OBJECTIVE / CATEGORY** | **8.1.** | **Computational Thinker** |
| **STANDARD** | | **Algorithms** |
| RELATED CONTENT / EXPECTATION | 8.1.3. | Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations. |

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| **STRAND / DOMAIN** | **AL.DLCS.8.** | **Digital Literacy and Computer Science** |
| **OBJECTIVE / CATEGORY** | **8.1.** | **Computational Thinker** |
| **STANDARD** | | **Programming and Development** |
| RELATED CONTENT / EXPECTATION | 8.1.5. | Discuss the efficiency of an algorithm or technology used to solve complex problems. |
| RELATED CONTENT / EXPECTATION | 8.1.6. | Describe how algorithmic processes and automation increase efficiency. |

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|---|---|---|
| **STRAND / DOMAIN** | **AL.DLCS.8.** | **Digital Literacy and Computer Science** |
| **OBJECTIVE / CATEGORY** | **8.4.** | **Computing Analyst** |
| **STANDARD** | | **Systems** |
| RELATED CONTENT / EXPECTATION | 8.4.23. | Design a digital artifact to propose a solution for a content-related problem. |

**Alaska Content and Performance Standards**

**Mathematics**

Grade **7** - Adopted: **2012**

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| **PERFORMANCE / CONTENT STANDARD** | **AK.MP.** | **Mathematical Practices** |

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|---|---|---|
| GRADE LEVEL EXPECTATION / STRAND | MP.1. | Make sense of problems and persevere in solving them. |
| GRADE LEVEL EXPECTATION / STRAND | MP.2. | Reason abstractly and quantitatively. |
| GRADE LEVEL EXPECTATION / STRAND | MP.3. | Construct viable arguments and critique the reasoning of others. |
| GRADE LEVEL EXPECTATION / STRAND | MP.4. | Model with mathematics. |
| GRADE LEVEL EXPECTATION / STRAND | MP.6. | Attend to precision. |
| GRADE LEVEL EXPECTATION / STRAND | MP.7. | Look for and make use of structure. |

**Alaska Content and Performance Standards**

**Mathematics**

Grade **8** - Adopted: **2012**

| PERFORMANCE / CONTENT STANDARD | AK.MP. | Mathematical Practices |
|---|---|---|
| GRADE LEVEL EXPECTATION / STRAND | MP.1. | Make sense of problems and persevere in solving them. |
| GRADE LEVEL EXPECTATION / STRAND | MP.2. | Reason abstractly and quantitatively. |
| GRADE LEVEL EXPECTATION / STRAND | MP.3. | Construct viable arguments and critique the reasoning of others. |
| GRADE LEVEL EXPECTATION / STRAND | MP.4. | Model with mathematics. |
| GRADE LEVEL EXPECTATION / STRAND | MP.6. | Attend to precision. |
| GRADE LEVEL EXPECTATION / STRAND | MP.7. | Look for and make use of structure. |

**Science**

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

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|---|---|---|
| **PERFORMANCE / CONTENT STANDARD** | | **MIDDLE SCHOOL EARTH AND SPACE SCIENCES** |
| **GRADE LEVEL EXPECTATION / STRAND** | | **Earth's Systems** |
| GOAL | MS-ESS3-1. | Construct an evidence-based explanation for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |

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|---|---|---|
| **PERFORMANCE / CONTENT STANDARD** | | **MIDDLE SCHOOL EARTH AND SPACE SCIENCES** |
| **GRADE LEVEL EXPECTATION / STRAND** | | **Weather and Climate** |
| GOAL | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |

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| **PERFORMANCE / CONTENT STANDARD** | | **MIDDLE SCHOOL EARTH AND SPACE SCIENCES** |
| **GRADE LEVEL EXPECTATION / STRAND** | | **Human Impacts** |
| GOAL | MS-ESS3-3. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. |
| GOAL | 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. |

**Alaska Content and Performance Standards**

**Science**

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

| | | |
|---|---|---|
| **PERFORMANCE / CONTENT STANDARD** | | **MIDDLE SCHOOL EARTH AND SPACE SCIENCES** |
| **GRADE LEVEL EXPECTATION / STRAND** | | **Earth's Systems** |
| GOAL | MS-ESS3-1. | Construct an evidence-based explanation for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |

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| **PERFORMANCE / CONTENT STANDARD** | | **MIDDLE SCHOOL EARTH AND SPACE SCIENCES** |
| **GRADE LEVEL EXPECTATION / STRAND** | | **Weather and Climate** |
| GOAL | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |

| PERFORMANCE / CONTENT STANDARD | | MIDDLE SCHOOL EARTH AND SPACE SCIENCES |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Human Impacts** |
| GOAL | MS-ESS3-3. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. |
| GOAL | 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. |

**Alaska Content and Performance Standards**

**Technology Education**

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

| PERFORMANCE / CONTENT STANDARD | | Alaska Computer Science Standards |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Algorithms and Programming** |
| **GOAL** | | **Algorithms** |
| INDICATOR | 7.AP.A.01. | Select and modify an existing algorithm in natural language or pseudocode to solve complex problems. |

| PERFORMANCE / CONTENT STANDARD | | Alaska Computer Science Standards |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Algorithms and Programming** |
| **GOAL** | | **Program Development** |
| INDICATOR | 7.AP.PD.01. | Seek and incorporate feedback from team members and users to refine a solution to a problem. |

| PERFORMANCE / CONTENT STANDARD | | Alaska Digital Literacy Standards |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Innovative Design** |
| GOAL | 6-12.ID.1. | Students engage in a design process and employ it to generate ideas, create innovative products or solve authentic problems. |
| GOAL | 6-12.ID.3. | Students engage in a design process to develop, test and revise prototypes, embracing the cyclical process of trial and error and understanding problems or setbacks as potential opportunities for improvement. |
| GOAL | 6-12.ID.4. | Students demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems. |

| PERFORMANCE / CONTENT STANDARD | | Alaska Digital Literacy Standards |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Computational Thinking** |
| GOAL | 6-12.CT.1. | Students practice defining problems to solve by computing for data analysis, modeling or algorithmic thinking. |
| GOAL | 6-12.CT.3. | Students break problems into component parts, identify key pieces and use that information to problem solve. |
| GOAL | 6-12.CT.4. | Students demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions. |

**Alaska Content and Performance Standards**

**Technology Education**

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

| PERFORMANCE / CONTENT STANDARD | | Alaska Computer Science Standards |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Algorithms and Programming** |
| **GOAL** | | **Program Development** |
| INDICATOR | 8.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. |

| PERFORMANCE / CONTENT STANDARD | | Alaska Digital Literacy Standards |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Innovative Design** |
| GOAL | 6-12.ID.1. | Students engage in a design process and employ it to generate ideas, create innovative products or solve authentic problems. |
| GOAL | 6-12.ID.3. | Students engage in a design process to develop, test and revise prototypes, embracing the cyclical process of trial and error and understanding problems or setbacks as potential opportunities for improvement. |
| GOAL | 6-12.ID.4. | Students demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems. |

| PERFORMANCE / CONTENT STANDARD | | Alaska Digital Literacy Standards |
|---|---|---|
| **GRADE LEVEL EXPECTATION / STRAND** | | **Computational Thinking** |
| GOAL | 6-12.CT.1. | Students practice defining problems to solve by computing for data analysis, modeling or algorithmic thinking. |

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|---|---|---|
| GOAL | 6-12.CT.3. | Students break problems into component parts, identify key pieces and use that information to problem solve. |
| GOAL | 6-12.CT.4. | Students demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions. |

**Arizona's College and Career Ready Standards**

**Mathematics**

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

| STRAND | | Standards for Mathematical Practice |
|---|---|---|
| CONCEPT / STANDARD | MP.1 | Make sense of problems and persevere in solving them. |
| CONCEPT / STANDARD | MP.2 | Reason abstractly and quantitatively. |
| CONCEPT / STANDARD | MP.3 | Construct viable arguments and critique the reasoning of others. |
| CONCEPT / STANDARD | MP.4 | Model with mathematics. |
| CONCEPT / STANDARD | MP.6 | Attend to precision. |
| CONCEPT / STANDARD | MP.7 | Look for and make use of structure. |

**Arizona's College and Career Ready Standards**

**Mathematics**

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

| STRAND | | Standards for Mathematical Practice |
|---|---|---|
| CONCEPT / STANDARD | MP.1 | Make sense of problems and persevere in solving them. |
| CONCEPT / STANDARD | MP.2 | Reason abstractly and quantitatively. |
| CONCEPT / STANDARD | MP.3 | Construct viable arguments and critique the reasoning of others. |
| CONCEPT / STANDARD | MP.4 | Model with mathematics. |
| CONCEPT / STANDARD | MP.6 | Attend to precision. |
| CONCEPT / STANDARD | MP.7 | Look for and make use of structure. |

**Arizona's College and Career Ready Standards**

**Science**

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

| | | |
|---|---|---|
| **STRAND** | | **Core Ideas for Knowing Science** |
| **CONCEPT / STANDARD** | | **Earth and Space Science** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | E1: | The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate. |

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| **STRAND** | | **Core Ideas for Using Science** |
| CONCEPT / STANDARD | U2: | The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. |
| CONCEPT / STANDARD | U3: | Applications of science often have both positive and negative ethical, social, economic, and/or political implications. |

**Arizona's College and Career Ready Standards**

**Science**

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

| | | |
|---|---|---|
| **STRAND** | | **Core Ideas for Knowing Science** |
| **CONCEPT / STANDARD** | | **Earth and Space Science** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | E1: | The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate. |

| | | |
|---|---|---|
| **STRAND** | | **Core Ideas for Using Science** |
| CONCEPT / STANDARD | U2: | The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. |
| CONCEPT / STANDARD | U3: | Applications of science often have both positive and negative ethical, social, economic, and/or political implications. |

| | | |
|---|---|---|
| **STRAND** | | **Eighth Grade: Focus on Cause and Effect; Energy and Matter; Stability and Change** |
| **CONCEPT / STANDARD** | | **Earth and Space Sciences: Students explore natural and human-induced cause-and-effect changes in Earth systems over time.** |
| **PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL** | | **Earth and Space Standards** |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 8.E1U3.8. | Construct and support an argument about how human consumption of limited resources impacts the biosphere. |

**Arizona's College and Career Ready Standards**

**Technology Education**

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

| STRAND | | Arizona Educational Technology Standards 2022 |
|---|---|---|
| **CONCEPT / STANDARD** | **Standard 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.** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.3.d. | Students explore real-world problems and issues and actively pursue solutions for them. |

| STRAND | | Arizona Educational Technology Standards 2022 |
|---|---|---|
| **CONCEPT / STANDARD** | **Standard 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.** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.4.a. | Students engage in a design process for generating and testing ideas and developing innovative products to solve problems. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 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. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.4.c. | Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.4.d. | Students demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems. |

| STRAND | | Arizona Educational Technology Standards 2022 |
|---|---|---|
| **CONCEPT / STANDARD** | **Standard 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.** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.a. | Students practice defining and solving problems by selecting technology for data analysis, modeling, and algorithmic thinking. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.b. | Students find and organize data and use technology to analyze and represent it to solve problems and make decisions. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.c. | Students break problems into component parts, identify key pieces, and use that information to solve problems. |

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| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.d. | Students understand how automation works and apply algorithmic thinking to design and automate solutions. |

| **STRAND** | | **Arizona Educational Technology Standards 2022** |
|---|---|---|
| **CONCEPT / STANDARD** | **Standard 6.** | **Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.6.b. | Students create original works or responsibly repurpose digital resources into new creative works. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.6.c. | Students create artifacts using digital tools to communicate complex ideas textually, visually, graphically, and auditorily. |

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

| **STRAND** | | **Computer Science** |
|---|---|---|
| **CONCEPT / STANDARD** | | **Practices** |
| **PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL** | **Practice 3.** | **Recognizing and Defining Computational Problems: The ability to recognize appropriate and worthwhile opportunities to apply computation is a skill that develops over time and is central to computing. Solving a problem with a computational approach requires defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate.** |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 3.1. | Identify complex, interdisciplinary, real-world problems that can be solved computationally. |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 3.2. | Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures. |

| **STRAND** | | **Computer Science** |
|---|---|---|
| **CONCEPT / STANDARD** | | **Practices** |
| **PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL** | **Practice 5.** | **Creating Computational Artifacts: The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps.** |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 5.2. | Create a computational artifact for practical intent, personal expression, or to address a societal issue. |

| **STRAND** | | **Computer Science** |
|---|---|---|
| **CONCEPT / STANDARD** | | **Practices** |

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| **PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL** | **Practice 6.** | **Testing and Refining Computational Artifacts: Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts.** |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 6.1. | Systematically test computational artifacts by considering all scenarios and using test cases. |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 6.3. | Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility. |

**Arizona's College and Career Ready Standards**

**Technology Education**

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

| | | |
|---|---|---|
| **STRAND** | | **Arizona Educational Technology Standards 2022** |
| **CONCEPT / STANDARD** | **Standard 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.** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.3.d. | Students explore real-world problems and issues and actively pursue solutions for them. |

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|---|---|---|
| **STRAND** | | **Arizona Educational Technology Standards 2022** |
| **CONCEPT / STANDARD** | **Standard 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.** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.4.a. | Students engage in a design process for generating and testing ideas and developing innovative products to solve problems. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 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. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.4.c. | Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.4.d. | Students demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems. |

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| **STRAND** | | **Arizona Educational Technology Standards 2022** |
| **CONCEPT / STANDARD** | **Standard 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.** |

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| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.a. | Students practice defining and solving problems by selecting technology for data analysis, modeling, and algorithmic thinking. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.b. | Students find and organize data and use technology to analyze and represent it to solve problems and make decisions. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.c. | Students break problems into component parts, identify key pieces, and use that information to solve problems. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.5.d. | Students understand how automation works and apply algorithmic thinking to design and automate solutions. |

| **STRAND** | | **Arizona Educational Technology Standards 2022** |
|---|---|---|
| **CONCEPT / STANDARD** | **Standard 6.** | **Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.** |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.6.b. | Students create original works or responsibly repurpose digital resources into new creative works. |
| PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL | 6-8.6.c. | Students create artifacts using digital tools to communicate complex ideas textually, visually, graphically, and auditorily. |

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

| **STRAND** | | **Computer Science** |
|---|---|---|
| **CONCEPT / STANDARD** | | **Practices** |
| **PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL** | **Practice 3.** | **Recognizing and Defining Computational Problems: The ability to recognize appropriate and worthwhile opportunities to apply computation is a skill that develops over time and is central to computing. Solving a problem with a computational approach requires defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate.** |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 3.1. | Identify complex, interdisciplinary, real-world problems that can be solved computationally. |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 3.2. | Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures. |

| **STRAND** | | **Computer Science** |
|---|---|---|
| **CONCEPT / STANDARD** | | **Practices** |

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| **PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL** | **Practice 5.** | **Creating Computational Artifacts: The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps.** |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 5.2. | Create a computational artifact for practical intent, personal expression, or to address a societal issue. |

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| **STRAND** | | **Computer Science** |
| **CONCEPT / STANDARD** | | **Practices** |
| **PERFORMANCE OBJECTIVE / PROFICIENCY LEVEL** | **Practice 6.** | **Testing and Refining Computational Artifacts: Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts.** |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 6.1. | Systematically test computational artifacts by considering all scenarios and using test cases. |
| OBJECTIVE / GRADE LEVEL EXPECTATION | 6.3. | Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility. |

**Arkansas Standards**

**Mathematics**

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

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| **STRAND / TOPIC** | | **Grade 7 Mathematics Standards** |
| **CONTENT STANDARD** | **7.NCC.** | **Number Concepts & Computations** |
| **PERFORMANCE EXPECTATION** | | **Rational Numbers - Students model and compute with rational numbers.** |
| BENCHMARK / PROFICIENCY | 7.NCC.1. | Represent addition and subtraction of rational numbers in real-world contexts using a variety of forms. |

**Arkansas Standards**

**Science**

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

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| **STRAND / TOPIC** | **AR.SC.5.** | **Earth's Systems** |
| **CONTENT STANDARD** | | **Students who demonstrate understanding can:** |
| PERFORMANCE EXPECTATION | 7-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |

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| **STRAND / TOPIC** | **AR.SC.8.** | **Engineering, Technology, and Applications of Science** |
| **CONTENT STANDARD** | | **Students who demonstrate understanding can:** |

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| PERFORMANCE EXPECTATION | 7-ETS1-1. | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| PERFORMANCE EXPECTATION | 7-ETS1-2. | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |
| PERFORMANCE EXPECTATION | 7-ETS1-4. | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |

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

| **STRAND / TOPIC** | **AR.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
|---|---|---|
| **CONTENT STANDARD** | | **Key Ideas and Details** |
| PERFORMANCE 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. |
| PERFORMANCE EXPECTATION | RST.6-8.3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |

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

| **STRAND / TOPIC** | **AR.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
|---|---|---|
| **CONTENT STANDARD** | | **Integration of Knowledge and Ideas** |
| PERFORMANCE 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 / TOPIC** | **AR.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
|---|---|---|
| **CONTENT STANDARD** | | **Range of Reading and Level of Text Complexity** |

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| PERFORMANCE 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. |

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

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

**Arkansas Standards**

**Science**

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

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| **STRAND / TOPIC** | **AR.SC.1.** | **Waves and Electromagnetic Radiation** |
| **CONTENT STANDARD** | | **Students who demonstrate understanding can:** |
| PERFORMANCE EXPECTATION | 8-PS4-3. | Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. |

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| **STRAND / TOPIC** | **AR.SC.8.** | **Engineering, Technology, and Applications of Science** |
| **CONTENT STANDARD** | | **Students who demonstrate understanding can:** |
| PERFORMANCE EXPECTATION | 8-ETS1-1. | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| PERFORMANCE EXPECTATION | 8-ETS1-2. | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |

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| PERFORMANCE EXPECTATION | 8-ETS1-4. | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |

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

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| **STRAND / TOPIC** | **AR.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **CONTENT STANDARD** | | **Key Ideas and Details** |
| PERFORMANCE 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. |
| PERFORMANCE EXPECTATION | RST.6-8.3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |

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

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| **STRAND / TOPIC** | **AR.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **CONTENT STANDARD** | | **Integration of Knowledge and Ideas** |
| PERFORMANCE 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. |

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| **STRAND / TOPIC** | **AR.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **CONTENT STANDARD** | | **Range of Reading and Level of Text Complexity** |
| PERFORMANCE 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. |

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

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

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

**Arkansas Standards**

**Technology Education**

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

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|---|---|---|
| **STRAND / TOPIC** | | **Computer Science: Coding Block for Grades 7 or 8 Standards** |
| **CONTENT STANDARD** | | **Computational Thinking and Problem Solving** |
| **PERFORMANCE EXPECTATION** | | **Content Cluster 1: Students will analyze and utilize problem-solving strategies.** |
| BENCHMARK / PROFICIENCY | CSCB.1.2. | Describe the steps needed to efficiently solve a problem |

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| **STRAND / TOPIC** | | **Computer Science: 5-8 Standards Document** |
| **CONTENT STANDARD** | | **Algorithms and Programs** |
| **PERFORMANCE EXPECTATION** | | **Content Cluster 1: Students will analyze and utilize problem-solving strategies.** |
| BENCHMARK / PROFICIENCY | CSK8.G7.1.1. | Identify and utilize level-appropriate, algorithmic problem-solving strategies |
| BENCHMARK / PROFICIENCY | CSK8.G7.1.2. | Utilize visual representations of problem-solving logic (e.g., flowcharts) to solve problems of level-appropriate complexity |
| BENCHMARK / PROFICIENCY | CSK8.G7.1.3. | Demonstrate appropriate collaborative behaviors (e.g., accepting multiple perspectives, integrating feedback, providing useful feedback, understanding and using socialization) to solve problems |
| BENCHMARK / PROFICIENCY | CSK8.G7.1.4. | Apply strategies for identifying and solving routine hardware and software problems that occur during everyday computer use |

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| **STRAND / TOPIC** | | **Computer Science: 5-8 Standards Document** |
| **CONTENT STANDARD** | | **Professionalism and Impacts of Computing** |

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| **PERFORMANCE EXPECTATION** | | **Content Cluster 5: Students will create, evaluate, and modify algorithms.** |
| BENCHMARK / PROFICIENCY | CSK8.G7.5.1. | Create algorithms using constraints to solve problems and evaluate effectiveness |
| BENCHMARK / PROFICIENCY | CSK8.G7.5.2. | Design and test algorithms using technology |
| BENCHMARK / PROFICIENCY | CSK8.G7.5.4. | Identify and correct multiple errors within a level-appropriate program |

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| **STRAND / TOPIC** | | **Computer Science: 5-8 Standards Document** |
| **CONTENT STANDARD** | | **Professionalism and Impacts of Computing** |
| **PERFORMANCE EXPECTATION** | | **Content Cluster 6: Students will create programs to solve problems.** |
| BENCHMARK / PROFICIENCY | CSK8.G7.6.1. | Use a visual block-based or text-based programming language individually and collaboratively to solve level-appropriate problems |

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| **STRAND / TOPIC** | | **Computer Science: 5-8 Standards Document** |
| **CONTENT STANDARD** | | **Professionalism and Impacts of Computing** |
| **PERFORMANCE EXPECTATION** | | **Content Cluster 7: Students will analyze the utilization of computers within industry.** |
| BENCHMARK / PROFICIENCY | CSK8.G7.7.1. | Describe ways in which computers use models of intelligent behavior (e.g., computer vision, language understanding, robot motion, speech) |

**Arkansas Standards**

**Technology Education**

Grade **8** - Adopted: **2020/Beginning 2021**

| | | |
|---|---|---|
| **STRAND / TOPIC** | | **Computer Science: Coding Block for Grades 7 or 8 Standards** |
| **CONTENT STANDARD** | | **Computational Thinking and Problem Solving** |
| **PERFORMANCE EXPECTATION** | | **Content Cluster 1: Students will analyze and utilize problem-solving strategies.** |
| BENCHMARK / PROFICIENCY | CSCB.1.2. | Describe the steps needed to efficiently solve a problem |

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|---|---|---|
| **STRAND / TOPIC** | | **Computer Science: 5-8 Standards Document** |
| **CONTENT STANDARD** | | **Algorithms and Programs** |
| **PERFORMANCE EXPECTATION** | | **Content Cluster 1: Students will analyze and utilize problem-solving strategies.** |

| | | |
|---|---|---|
| BENCHMARK / PROFICIENCY | CSK8.G8.1.1. | Identify and utilize level-appropriate, algorithmic problem-solving strategies |
| BENCHMARK / PROFICIENCY | CSK8.G8.1.2. | Utilize visual representations of problem-solving logic (e.g., flowcharts) to solve problems of level-appropriate complexity |
| BENCHMARK / PROFICIENCY | CSK8.G8.1.3. | Demonstrate appropriate collaborative behaviors (e.g., accepting multiple perspectives, integrating feedback, providing useful feedback, understanding and using socialization) to solve problems |
| BENCHMARK / PROFICIENCY | CSK8.G8.1.4. | Apply strategies for identifying and solving routine hardware and software problems that occur in everyday computer use |
| **STRAND / TOPIC** | | **Computer Science: 5-8 Standards Document** |
| **CONTENT STANDARD** | | **Professionalism and Impacts of Computing** |
| **PERFORMANCE EXPECTATION** | | **Content Cluster 5: Students will create, evaluate, and modify algorithms.** |
| BENCHMARK / PROFICIENCY | CSK8.G8.5.1. | Create algorithms using constraints to solve problems and evaluate effectiveness |
| BENCHMARK / PROFICIENCY | CSK8.G8.5.2. | Design and test algorithms using technology |
| BENCHMARK / PROFICIENCY | CSK8.G8.5.4. | Identify and correct multiple errors within a level-appropriate program |

**California Content Standards**

**Mathematics**

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

| CONTENT STANDARD / DOMAIN / PART | CA.CC.MP. | Standards for Mathematical Practice |
|---|---|---|
| PERFORMANCE STANDARD / MODE | MP.1. | Make sense of problems and persevere in solving them. |
| PERFORMANCE STANDARD / MODE | MP.2. | Reason abstractly and quantitatively. |
| PERFORMANCE STANDARD / MODE | MP.3. | Construct viable arguments and critique the reasoning of others. |
| PERFORMANCE STANDARD / MODE | MP.4. | Model with mathematics. |

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| PERFORMANCE STANDARD / MODE | MP.6. | Attend to precision. |
| PERFORMANCE STANDARD / MODE | MP.7. | Look for and make use of structure. |

**California Content Standards**

**Mathematics**

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

| CONTENT STANDARD / DOMAIN / PART | CA.CC.MP. | Standards for Mathematical Practice |
|---|---|---|
| PERFORMANCE STANDARD / MODE | MP.1. | Make sense of problems and persevere in solving them. |
| PERFORMANCE STANDARD / MODE | MP.2. | Reason abstractly and quantitatively. |
| PERFORMANCE STANDARD / MODE | MP.3. | Construct viable arguments and critique the reasoning of others. |
| PERFORMANCE STANDARD / MODE | MP.4. | Model with mathematics. |
| PERFORMANCE STANDARD / MODE | MP.6. | Attend to precision. |
| PERFORMANCE STANDARD / MODE | MP.7. | Look for and make use of structure. |

**California Content Standards**

**Science**

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

| CONTENT STANDARD / DOMAIN / PART | CA.MS-ESS. | EARTH AND SPACE SCIENCE |
|---|---|---|
| **PERFORMANCE STANDARD / MODE** | **MS-ESS3.** | **Earth and Human Activity** |
| **EXPECTATION / SUBSTRAND** | | **Students who demonstrate understanding can:** |
| FOUNDATION / PROFICIENCY LEVEL | MS-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |

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| **CONTENT STANDARD / DOMAIN / PART** | **CA.MS-ETS.** | **ENGINEERING DESIGN** |
| **PERFORMANCE STANDARD / MODE** | **MS-ETS1.** | **Engineering Design** |
| **EXPECTATION / SUBSTRAND** | | **Students who demonstrate understanding can:** |
| FOUNDATION / PROFICIENCY LEVEL | MS-ETS1-1. | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| FOUNDATION / PROFICIENCY LEVEL | MS-ETS1-2. | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |
| FOUNDATION / PROFICIENCY LEVEL | MS-ETS1-4. | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Key Ideas and Details** |
| EXPECTATION / SUBSTRAND | 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. |
| EXPECTATION / SUBSTRAND | RST.6-8.3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Craft and Structure** |
| EXPECTATION / SUBSTRAND | 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. |
| EXPECTATION / SUBSTRAND | RST.6-8.5. | Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Integration of Knowledge and Ideas** |
| EXPECTATION / SUBSTRAND | 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. |

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| **CONTENT STANDARD / DOMAIN / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Range of Reading and Level of Text Complexity** |
| EXPECTATION / SUBSTRAND | 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. |

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

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

**California Content Standards**

**Science**

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

| | | |
|---|---|---|
| **CONTENT STANDARD / DOMAIN / PART** | **CA.MS-PS.** | **PHYSICAL SCIENCE** |
| **PERFORMANCE STANDARD / MODE** | **MS-PS4.** | **Waves and Their Applications in Technologies for Information Transfer** |
| **EXPECTATION / SUBSTRAND** | | **Students who demonstrate understanding can:** |
| FOUNDATION / PROFICIENCY LEVEL | MS-PS4-3. | Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. |

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| **CONTENT STANDARD / DOMAIN / PART** | **CA.MS-ESS.** | **EARTH AND SPACE SCIENCE** |
| **PERFORMANCE STANDARD / MODE** | **MS-ESS3.** | **Earth and Human Activity** |

| | | |
|---|---|---|
| **EXPECTATION / SUBSTRAND** | | **Students who demonstrate understanding can:** |
| FOUNDATION / PROFICIENCY LEVEL | 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. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.MS-ETS.** | **ENGINEERING DESIGN** |
| **PERFORMANCE STANDARD / MODE** | **MS-ETS1.** | **Engineering Design** |
| **EXPECTATION / SUBSTRAND** | | **Students who demonstrate understanding can:** |
| FOUNDATION / PROFICIENCY LEVEL | MS-ETS1-1. | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| FOUNDATION / PROFICIENCY LEVEL | MS-ETS1-2. | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |
| FOUNDATION / PROFICIENCY LEVEL | MS-ETS1-4. | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Key Ideas and Details** |
| EXPECTATION / SUBSTRAND | 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. |
| EXPECTATION / SUBSTRAND | RST.6-8.3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Craft and Structure** |
| EXPECTATION / SUBSTRAND | 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. |
| EXPECTATION / SUBSTRAND | RST.6-8.5. | Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |

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|---|---|---|
| **PERFORMANCE STANDARD / MODE** | | **Integration of Knowledge and Ideas** |
| EXPECTATION / SUBSTRAND | 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 / PART** | **CA.RST.6-8.** | **Reading Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Range of Reading and Level of Text Complexity** |
| EXPECTATION / SUBSTRAND | RST.6-8.10. | By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.WHST.6-8.** | **Writing Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Text Types and Purposes** |
| **EXPECTATION / SUBSTRAND** | **WHST.6-8.2.** | **Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** |
| FOUNDATION / PROFICIENCY LEVEL | WHST.6-8.2.d. | Use precise language and domain-specific vocabulary to inform about or explain the topic. |
| **CONTENT STANDARD / DOMAIN / PART** | **CA.WHST.6-8.** | **Writing Standards for Literacy in Science and Technical Subjects** |
| **PERFORMANCE STANDARD / MODE** | | **Production and Distribution of Writing** |
| EXPECTATION / SUBSTRAND | WHST.6-8.4. | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| EXPECTATION / SUBSTRAND | WHST.6-8.6. | Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. |

**California Content Standards**

**Technology Education**

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

| | | |
|---|---|---|
| **CONTENT STANDARD / DOMAIN / PART** | | **Computer Science Core Practices** |
| **PERFORMANCE STANDARD / MODE** | **P3.** | **Core Practice 3 – Recognizing and Defining Computational Problems** |
| EXPECTATION / SUBSTRAND | P3.1. | Identify complex, interdisciplinary, real-world problems that can be solved computationally. |
| **CONTENT STANDARD / DOMAIN / PART** | | **Algorithms & Programming** |

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|---|---|---|
| **PERFORMANCE STANDARD / MODE** | | **Algorithms** |
| EXPECTATION / SUBSTRAND | 6-8.AP.10. | Use flowcharts and/or pseudocode to design and illustrate algorithms that solve complex problems. (P4.1, P4.4) |

**California Content Standards**

**Technology Education**

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

| | | |
|---|---|---|
| **CONTENT STANDARD / DOMAIN / PART** | | **Computer Science Core Practices** |
| **PERFORMANCE STANDARD / MODE** | **P3.** | **Core Practice 3 – Recognizing and Defining Computational Problems** |
| EXPECTATION / SUBSTRAND | P3.1. | Identify complex, interdisciplinary, real-world problems that can be solved computationally. |

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|---|---|---|
| **CONTENT STANDARD / DOMAIN / PART** | | **Algorithms & Programming** |
| **PERFORMANCE STANDARD / MODE** | | **Algorithms** |
| EXPECTATION / SUBSTRAND | 6-8.AP.10. | Use flowcharts and/or pseudocode to design and illustrate algorithms that solve complex problems. (P4.1, P4.4) |

**Colorado Academic Standards (CAS)**

**Mathematics**

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

| | | |
|---|---|---|
| **CONTENT AREA** | | **Prepared Graduates in Mathematics** |
| STANDARD | MP1. | Make sense of problems and persevere in solving them. |
| STANDARD | MP2. | Reason abstractly and quantitatively. |
| STANDARD | MP3. | Construct viable arguments and critique the reasoning of others. |
| STANDARD | MP4. | Model with mathematics. |
| STANDARD | MP6. | Attend to precision. |
| STANDARD | MP7. | Look for and make use of structure. |

**Colorado Academic Standards (CAS)**

**Mathematics**

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

| | | |
|---|---|---|
| **CONTENT AREA** | | **Prepared Graduates in Mathematics** |

| | | |
|---|---|---|
| STANDARD | MP1. | Make sense of problems and persevere in solving them. |
| STANDARD | MP2. | Reason abstractly and quantitatively. |
| STANDARD | MP3. | Construct viable arguments and critique the reasoning of others. |
| STANDARD | MP4. | Model with mathematics. |
| STANDARD | MP6. | Attend to precision. |
| STANDARD | MP7. | Look for and make use of structure. |

**Colorado Academic Standards (CAS)**

**Science**

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

| CONTENT AREA | | Prepared Graduates in Science |
|---|---|---|
| STANDARD | 1 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding structure, properties and interactions of matter. |
| STANDARD | 2 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding interactions between objects and within systems of objects. |
| STANDARD | 3 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how energy is transferred and conserved. |
| STANDARD | 4 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how waves are used to transfer energy and information. |
| STANDARD | 5 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how individual organisms are configured and how these structures function to support life, growth, behavior and reproduction. |
| STANDARD | 6 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how living systems interact with the biotic and abiotic environment. |
| STANDARD | 7 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how genetic and environmental factors influence variation of organisms across generations. |
| STANDARD | 8 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how natural selection drives biological evolution accounting for the unity and diversity of organisms. |
| STANDARD | 9 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding the universe and Earth's place in it. |
| STANDARD | 10 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how and why Earth is constantly changing. |

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| STANDARD | 11 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how human activities and the Earth's surface processes interact. |

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|---|---|---|
| **CONTENT AREA** | **SC.MS.3.** | **Earth and Space Science** |
| **STANDARD** | **SC.MS.3.8.** | **Humans depend on Earth's land, ocean, atmosphere, and biosphere for different resources, many of which are limited or not renewable. Resources are distributed unevenly around the planet as a result of past geologic processes.** |
| **CONCEPTS AND SKILLS / EVIDENCE OUTCOMES** | | **Evidence Outcomes** |
| **EVIDENCE OUTCOMES** | | **Students Can:** |
| INDICATOR | SC.MS.3.8.a. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. (MS-ESS3-1) |

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|---|---|---|
| **CONTENT AREA** | **SC.MS.3.** | **Earth and Space Science** |
| **STANDARD** | **SC.MS.3.10.** | **Human activities have altered the biosphere, sometimes damaging it, although changes to environments can have different impacts for different living things.** |
| **CONCEPTS AND SKILLS / EVIDENCE OUTCOMES** | | **Evidence Outcomes** |
| **EVIDENCE OUTCOMES** | | **Students Can:** |
| INDICATOR | SC.MS.3.10.a. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (MS-ESS3-3) |
| INDICATOR | SC.MS.3.10.b. | Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. (MS-ESS3-4) |

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|---|---|---|
| **CONTENT AREA** | **SC.MS.3.** | **Earth and Space Science** |
| **STANDARD** | **SC.MS.3.11.** | **Human activities affect global warming. Decisions to reduce the impact of global warming depend on understanding climate science, engineering capabilities, and social dynamics.** |
| **CONCEPTS AND SKILLS / EVIDENCE OUTCOMES** | | **Evidence Outcomes** |
| **EVIDENCE OUTCOMES** | | **Students Can:** |
| INDICATOR | SC.MS.3.11.a. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. (MS-ESS3-5) |

**Colorado Academic Standards (CAS)**

**Science**

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

| | | |
|---|---|---|
| **CONTENT AREA** | | **Prepared Graduates in Science** |

| | | |
|---|---|---|
| STANDARD | 1 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding structure, properties and interactions of matter. |
| STANDARD | 2 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding interactions between objects and within systems of objects. |
| STANDARD | 3 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how energy is transferred and conserved. |
| STANDARD | 4 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how waves are used to transfer energy and information. |
| STANDARD | 5 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how individual organisms are configured and how these structures function to support life, growth, behavior and reproduction. |
| STANDARD | 6 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how living systems interact with the biotic and abiotic environment. |
| STANDARD | 7 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how genetic and environmental factors influence variation of organisms across generations. |
| STANDARD | 8 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how natural selection drives biological evolution accounting for the unity and diversity of organisms. |
| STANDARD | 9 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding the universe and Earth's place in it. |
| STANDARD | 10 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how and why Earth is constantly changing. |
| STANDARD | 11 | Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how human activities and the Earth's surface processes interact. |

| | | |
|---|---|---|
| **CONTENT AREA** | **SC.MS.3.** | **Earth and Space Science** |
| **STANDARD** | **SC.MS.3.8.** | **Humans depend on Earth's land, ocean, atmosphere, and biosphere for different resources, many of which are limited or not renewable. Resources are distributed unevenly around the planet as a result of past geologic processes.** |
| **CONCEPTS AND SKILLS / EVIDENCE OUTCOMES** | | **Evidence Outcomes** |
| **EVIDENCE OUTCOMES** | | **Students Can:** |
| INDICATOR | SC.MS.3.8.a. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. (MS-ESS3-1) |

| | | |
|---|---|---|
| **CONTENT AREA** | **SC.MS.3.** | **Earth and Space Science** |

| | | |
|---|---|---|
| **STANDARD** | **SC.MS.3.10.** | **Human activities have altered the biosphere, sometimes damaging it, although changes to environments can have different impacts for different living things.** |
| **CONCEPTS AND SKILLS / EVIDENCE OUTCOMES** | | **Evidence Outcomes** |
| **EVIDENCE OUTCOMES** | | **Students Can:** |
| INDICATOR | SC.MS.3.10.a. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (MS-ESS3-3) |
| INDICATOR | SC.MS.3.10.b. | Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. (MS-ESS3-4) |

| | | |
|---|---|---|
| **CONTENT AREA** | **SC.MS.3.** | **Earth and Space Science** |
| **STANDARD** | **SC.MS.3.11.** | **Human activities affect global warming. Decisions to reduce the impact of global warming depend on understanding climate science, engineering capabilities, and social dynamics.** |
| **CONCEPTS AND SKILLS / EVIDENCE OUTCOMES** | | **Evidence Outcomes** |
| **EVIDENCE OUTCOMES** | | **Students Can:** |
| INDICATOR | SC.MS.3.11.a. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. (MS-ESS3-5) |

**Connecticut State Standards**

**Mathematics**

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

| | | |
|---|---|---|
| **DOMAIN / CONTENT STANDARD** | **CT.CC.MP.7.** | **Mathematical Practices** |
| STATE FRAMEWORK | MP.7.1. | Make sense of problems and persevere in solving them. |
| STATE FRAMEWORK | MP.7.2. | Reason abstractly and quantitatively. |
| STATE FRAMEWORK | MP.7.3. | Construct viable arguments and critique the reasoning of others. |
| STATE FRAMEWORK | MP.7.4. | Model with mathematics. |
| STATE FRAMEWORK | MP.7.6. | Attend to precision. |
| STATE FRAMEWORK | MP.7.7. | Look for and make use of structure. |

**Connecticut State Standards**

**Mathematics**

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

| DOMAIN / CONTENT STANDARD | CT.CC.MP.8. | Mathematical Practices |
|---|---|---|
| STATE FRAMEWORK | MP.8.1. | Make sense of problems and persevere in solving them. |
| STATE FRAMEWORK | MP.8.2. | Reason abstractly and quantitatively. |
| STATE FRAMEWORK | MP.8.3. | Construct viable arguments and critique the reasoning of others. |
| STATE FRAMEWORK | MP.8.4. | Model with mathematics. |
| STATE FRAMEWORK | MP.8.6. | Attend to precision. |
| STATE FRAMEWORK | MP.8.7. | Look for and make use of structure. |

**Connecticut State Standards**

**Science**

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

| DOMAIN / CONTENT STANDARD | NGSS.MS-ESS. | EARTH AND SPACE SCIENCE |
|---|---|---|
| **STATE FRAMEWORK** | **MS-ESS3.** | **Earth and Human Activity** |
| **GRADE LEVEL EXPECTATION** | | **Students who demonstrate understanding can:** |
| INDICATOR | MS-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |
| 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. |
| INDICATOR | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |

| DOMAIN / CONTENT STANDARD | NGSS.MS-ETS. | ENGINEERING DESIGN |
|---|---|---|
| **STATE FRAMEWORK** | **MS-ETS1.** | **Engineering Design** |
| **GRADE LEVEL EXPECTATION** | | **Students who demonstrate understanding can:** |

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

**Connecticut State Standards**

**Science**

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

| DOMAIN / CONTENT STANDARD | NGSS.MS-ESS. | EARTH AND SPACE SCIENCE |
|---|---|---|
| **STATE FRAMEWORK** | **MS-ESS3.** | **Earth and Human Activity** |
| **GRADE LEVEL EXPECTATION** | | **Students who demonstrate understanding can:** |
| INDICATOR | MS-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |
| 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. |
| INDICATOR | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |

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

**Connecticut State Standards**

**Technology Education**

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

| DOMAIN / CONTENT STANDARD | | CSTA K-12 Computer Science Standards |
|---|---|---|
| STATE FRAMEWORK | CSTA.2. | Level 2 (Ages 11-14) |
| GRADE LEVEL EXPECTATION | 2-AP. | Algorithms & Programming |
| INDICATOR | | Algorithms |
| INDICATOR | 2-AP-10. | Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1) |

| DOMAIN / CONTENT STANDARD | | CSTA K-12 Computer Science Standards |
|---|---|---|
| STATE FRAMEWORK | CSTA.2. | Level 2 (Ages 11-14) |
| GRADE LEVEL EXPECTATION | 2-AP. | Algorithms & Programming |
| INDICATOR | | Modularity |
| INDICATOR | 2-AP-13. | Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2) |

| DOMAIN / CONTENT STANDARD | | CSTA K-12 Computer Science Standards |
|---|---|---|
| STATE FRAMEWORK | CSTA.2. | Level 2 (Ages 11-14) |
| GRADE LEVEL EXPECTATION | 2-AP. | Algorithms & Programming |
| INDICATOR | | Program Development |
| INDICATOR | 2-AP-15. | Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1) |

| DOMAIN / CONTENT STANDARD | | CSTA K-12 Computer Science Standards |
|---|---|---|
| STATE FRAMEWORK | CSTA.2. | Level 2 (Ages 11-14) |
| GRADE LEVEL EXPECTATION | 2-IC. | Impacts of Computing |
| INDICATOR | | Social Interactions |
| INDICATOR | 2-IC-22. | Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2) |

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

| DOMAIN / CONTENT STANDARD | | ISTE for Students (ISTE-S) |
|---|---|---|
| STATE FRAMEWORK | CO.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. |

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|---|---|---|
| GRADE LEVEL EXPECTATION | ISTE-S.3.d. | Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions. |
| **DOMAIN / CONTENT STANDARD** | | **ISTE for Students (ISTE-S)** |
| **STATE FRAMEWORK** | **CO.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.** |
| GRADE LEVEL EXPECTATION | ISTE-S.4.a. | Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. |
| GRADE LEVEL EXPECTATION | ISTE-S.4.b. | Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. |
| **DOMAIN / CONTENT STANDARD** | | **ISTE for Students (ISTE-S)** |
| **STATE FRAMEWORK** | **CO.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.** |
| GRADE LEVEL EXPECTATION | 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. |
| GRADE LEVEL EXPECTATION | 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. |
| GRADE LEVEL EXPECTATION | ISTE-S.5.d. | Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions. |

**Connecticut State Standards**

**Technology Education**

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

| | | |
|---|---|---|
| **DOMAIN / CONTENT STANDARD** | | **CSTA K-12 Computer Science Standards** |
| **STATE FRAMEWORK** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **GRADE LEVEL EXPECTATION** | **2-AP.** | **Algorithms & Programming** |
| **INDICATOR** | | **Algorithms** |
| INDICATOR | 2-AP-10. | Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1) |
| **DOMAIN / CONTENT STANDARD** | | **CSTA K-12 Computer Science Standards** |
| **STATE FRAMEWORK** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **GRADE LEVEL EXPECTATION** | **2-AP.** | **Algorithms & Programming** |
| **INDICATOR** | | **Modularity** |

| | | |
|---|---|---|
| INDICATOR | 2-AP-13. | Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2) |

| | | |
|---|---|---|
| **DOMAIN / CONTENT STANDARD** | | **CSTA K-12 Computer Science Standards** |
| **STATE FRAMEWORK** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **GRADE LEVEL EXPECTATION** | **2-AP.** | **Algorithms & Programming** |
| **INDICATOR** | | **Program Development** |
| INDICATOR | 2-AP-15. | Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1) |

| | | |
|---|---|---|
| **DOMAIN / CONTENT STANDARD** | | **CSTA K-12 Computer Science Standards** |
| **STATE FRAMEWORK** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **GRADE LEVEL EXPECTATION** | **2-IC.** | **Impacts of Computing** |
| **INDICATOR** | | **Social Interactions** |
| INDICATOR | 2-IC-22. | Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2) |

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

| | | |
|---|---|---|
| **DOMAIN / CONTENT STANDARD** | | **ISTE for Students (ISTE-S)** |
| **STATE FRAMEWORK** | **CO.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.** |
| GRADE LEVEL EXPECTATION | ISTE-S.3.d. | Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions. |

| | | |
|---|---|---|
| **DOMAIN / CONTENT STANDARD** | | **ISTE for Students (ISTE-S)** |
| **STATE FRAMEWORK** | **CO.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.** |
| GRADE LEVEL EXPECTATION | ISTE-S.4.a. | Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. |
| GRADE LEVEL EXPECTATION | ISTE-S.4.b. | Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. |

| | | |
|---|---|---|
| **DOMAIN / CONTENT STANDARD** | | **ISTE for Students (ISTE-S)** |
| **STATE FRAMEWORK** | **CO.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.** |

| | | |
|---|---|---|
| GRADE LEVEL EXPECTATION | 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. |
| GRADE LEVEL EXPECTATION | 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. |
| GRADE LEVEL EXPECTATION | ISTE-S.5.d. | Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions. |

**Delaware Standards and Instruction**

**Mathematics**

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

| STANDARD / STRAND | DE.CC.7.MP. | Mathematical Practices |
|---|---|---|
| STRAND / INDICATOR | CC.7.MP.1. | Make sense of problems and persevere in solving them. |
| STRAND / INDICATOR | CC.7.MP.2. | Reason abstractly and quantitatively. |
| STRAND / INDICATOR | CC.7.MP.3. | Construct viable arguments and critique the reasoning of others. |
| STRAND / INDICATOR | CC.7.MP.4. | Model with mathematics. |
| STRAND / INDICATOR | CC.7.MP.6. | Attend to precision. |
| STRAND / INDICATOR | CC.7.MP.7. | Look for and make use of structure. |

**Delaware Standards and Instruction**

**Mathematics**

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

| STANDARD / STRAND | DE.CC.8.MP. | Mathematical Practices |
|---|---|---|
| STRAND / INDICATOR | CC.8.MP.1. | Make sense of problems and persevere in solving them. |
| STRAND / INDICATOR | CC.8.MP.2. | Reason abstractly and quantitatively. |
| STRAND / INDICATOR | CC.8.MP.3. | Construct viable arguments and critique the reasoning of others. |
| STRAND / INDICATOR | CC.8.MP.4. | Model with mathematics. |

| | | |
|---|---|---|
| STRAND / INDICATOR | CC.8.MP.6. | Attend to precision. |
| STRAND / INDICATOR | CC.8.MP.7. | Look for and make use of structure. |

**Delaware Standards and Instruction**

**Science**

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

| | | |
|---|---|---|
| **STANDARD / STRAND** | **DE.MS-ESS.** | **EARTH AND SPACE SCIENCE** |
| **STRAND / INDICATOR** | **MS-ESS3.** | **Earth and Human Activity** |
| **ENDURING UNDERSTANDING** | | **Students who demonstrate understanding can:** |
| BENCHMARK | MS-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |
| BENCHMARK | MS-ESS3-3. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. |
| BENCHMARK | 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. |
| BENCHMARK | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |

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

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

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|---|---|---|
| **STANDARD / STRAND** | **DE.CC6-8RS/TS.** | **Reading Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Key Ideas and Details** |

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|---|---|---|
| ENDURING UNDERSTANDING | CC6-8RS/TS2. | Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. |
| ENDURING UNDERSTANDING | CC6-8RS/TS3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |
| **STANDARD / STRAND** | **DE.CC6-8RS/TS.** | **Reading Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Craft and Structure** |
| ENDURING UNDERSTANDING | CC6-8RS/TS4. | 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. |
| ENDURING UNDERSTANDING | CC6-8RS/TS5. | 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 / STRAND** | **DE.CC6-8RS/TS.** | **Reading Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Integration of Knowledge and Ideas** |
| ENDURING UNDERSTANDING | CC6-8RS/TS9. | 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 / STRAND** | **DE.CC6-8RS/TS.** | **Reading Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Range of Reading and Level of Text Complexity** |
| ENDURING UNDERSTANDING | CC6-8RS/TS10. | By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently. |
| **STANDARD / STRAND** | **DE.CC6-8WH/S/TS.** | **Writing Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Text Types and Purposes** |
| **ENDURING UNDERSTANDING** | **CC6-8WH/S/TS2.** | **Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** |
| BENCHMARK | CC6-8WH/S/TS2d. | Use precise language and domain-specific vocabulary to inform about or explain the topic. |
| **STANDARD / STRAND** | **DE.CC6-8WH/S/TS.** | **Writing Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Production and Distribution of Writing** |

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|---|---|---|
| ENDURING UNDERSTANDING | CC6-8WH/S/TS4. | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| ENDURING UNDERSTANDING | CC6-8WH/S/TS6. | Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. |

**Delaware Standards and Instruction**

**Science**

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

| STANDARD / STRAND | DE.MS-ESS. | EARTH AND SPACE SCIENCE |
|---|---|---|
| **STRAND / INDICATOR** | **MS-ESS3.** | **Earth and Human Activity** |
| **ENDURING UNDERSTANDING** | | **Students who demonstrate understanding can:** |
| BENCHMARK | MS-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |
| BENCHMARK | MS-ESS3-3. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. |
| BENCHMARK | 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. |
| BENCHMARK | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |

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

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

| STANDARD / STRAND | DE.CC6-8RS/TS. | Reading Standards for Literacy in Science and Technical Subjects 6-12 |
|---|---|---|
| **STRAND / INDICATOR** | | **Key Ideas and Details** |

| | | |
|---|---|---|
| ENDURING UNDERSTANDING | CC6-8RS/TS2. | Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. |
| ENDURING UNDERSTANDING | CC6-8RS/TS3. | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. |
| **STANDARD / STRAND** | **DE.CC6-8RS/TS.** | **Reading Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Craft and Structure** |
| ENDURING UNDERSTANDING | CC6-8RS/TS4. | 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. |
| ENDURING UNDERSTANDING | CC6-8RS/TS5. | 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 / STRAND** | **DE.CC6-8RS/TS.** | **Reading Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Integration of Knowledge and Ideas** |
| ENDURING UNDERSTANDING | CC6-8RS/TS9. | 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 / STRAND** | **DE.CC6-8RS/TS.** | **Reading Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Range of Reading and Level of Text Complexity** |
| ENDURING UNDERSTANDING | CC6-8RS/TS10. | By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently. |
| **STANDARD / STRAND** | **DE.CC6-8WH/S/TS.** | **Writing Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Text Types and Purposes** |
| **ENDURING UNDERSTANDING** | **CC6-8WH/S/TS2.** | **Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** |
| BENCHMARK | CC6-8WH/S/TS2d. | Use precise language and domain-specific vocabulary to inform about or explain the topic. |
| **STANDARD / STRAND** | **DE.CC6-8WH/S/TS.** | **Writing Standards for Literacy in Science and Technical Subjects 6-12** |
| **STRAND / INDICATOR** | | **Production and Distribution of Writing** |

| | | |
|---|---|---|
| ENDURING UNDERSTANDING | CC6-8WH/S/TS4. | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| ENDURING UNDERSTANDING | CC6-8WH/S/TS6. | Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. |

**Delaware Standards and Instruction**

**Technology Education**

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

| **STANDARD / STRAND** | | **Computer Science Content Standards** |
|---|---|---|
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-AP.** | **Algorithms & Programming** |
| **BENCHMARK** | | **Algorithms** |
| EXPECTATION | 2-AP-10. | Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1) |

| **STANDARD / STRAND** | | **Computer Science Content Standards** |
|---|---|---|
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-AP.** | **Algorithms & Programming** |
| **BENCHMARK** | | **Modularity** |
| EXPECTATION | 2-AP-13. | Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2) |

| **STANDARD / STRAND** | | **Computer Science Content Standards** |
|---|---|---|
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-AP.** | **Algorithms & Programming** |
| **BENCHMARK** | | **Program Development** |
| EXPECTATION | 2-AP-15. | Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1) |

| **STANDARD / STRAND** | | **Computer Science Content Standards** |
|---|---|---|
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-IC.** | **Impacts of Computing** |

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|---|---|---|
| **BENCHMARK** | | **Social Interactions** |
| EXPECTATION | 2-IC-22. | Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2) |

**Delaware Standards and Instruction**

**Technology Education**

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

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| **STANDARD / STRAND** | | **Computer Science Content Standards** |
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-AP.** | **Algorithms & Programming** |
| **BENCHMARK** | | **Algorithms** |
| EXPECTATION | 2-AP-10. | Use flowcharts and/or pseudocode to address complex problems as algorithms. (P4.4, P4.1) |

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| **STANDARD / STRAND** | | **Computer Science Content Standards** |
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-AP.** | **Algorithms & Programming** |
| **BENCHMARK** | | **Modularity** |
| EXPECTATION | 2-AP-13. | Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. (P3.2) |

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| **STANDARD / STRAND** | | **Computer Science Content Standards** |
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-AP.** | **Algorithms & Programming** |
| **BENCHMARK** | | **Program Development** |
| EXPECTATION | 2-AP-15. | Seek and incorporate feedback from team members and users to refine a solution that meets user needs. (P2.3, P1.1) |

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| **STANDARD / STRAND** | | **Computer Science Content Standards** |
| **STRAND / INDICATOR** | **CSTA.2.** | **Level 2 (Ages 11-14)** |
| **ENDURING UNDERSTANDING** | **2-IC.** | **Impacts of Computing** |
| **BENCHMARK** | | **Social Interactions** |

| | | |
|---|---|---|
| EXPECTATION | 2-IC-22. | Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact. (P2.4, P5.2) |

**Florida Standards**

**Mathematics**

Grade **7** - Adopted: **2020**

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|---|---|---|
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 1: Actively participate in effortful learning both individually and collectively.** |
| **BENCHMARK** | **MA.K12.MTR.1.1** | **Mathematicians who participate in effortful learning both individually and with others:** |
| INDICATOR | MA.K12.MTR.1.1a | Analyze the problem in a way that makes sense given the task. |
| INDICATOR | MA.K12.MTR.1.1b | Ask questions that will help with solving the task. |
| INDICATOR | MA.K12.MTR.1.1c | Build perseverance by modifying methods as needed while solving a challenging task. |
| INDICATOR | MA.K12.MTR.1.1d | Stay engaged and maintain a positive mindset when working to solve tasks. |
| INDICATOR | MA.K12.MTR.1.1e | Help and support each other when attempting a new method or approach. |

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| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 2: Demonstrate understanding by representing problems in multiple ways.** |
| **BENCHMARK** | **MA.K12.MTR.2.1** | **Demonstrate understanding by representing problems in multiple ways. Mathematicians who demonstrate understanding by representing problems in multiple ways:** |
| INDICATOR | MA.K12.MTR.2.1a | Build understanding through modeling and using manipulatives. |
| INDICATOR | MA.K12.MTR.2.1b | Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. |
| INDICATOR | MA.K12.MTR.2.1d | Express connections between concepts and representations. |
| INDICATOR | MA.K12.MTR.2.1e | Choose a representation based on the given context or purpose. |

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| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 3: Complete tasks with mathematical fluency.** |
| **BENCHMARK** | **MA.K12.MTR.3.1** | **Complete tasks with mathematical fluency.Mathematicians who complete tasks with mathematical fluency:** |

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|---|---|---|
| INDICATOR | MA.K12.MTR.3.1a | Select efficient and appropriate methods for solving problems within the given context. |
| INDICATOR | MA.K12.MTR.3.1b | Maintain flexibility and accuracy while performing procedures and mental calculations. |
| INDICATOR | MA.K12.MTR.3.1c | Complete tasks accurately and with confidence. |
| INDICATOR | MA.K12.MTR.3.1e | Use feedback to improve efficiency when performing calculations. |
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 4: Engage in discussions that reflect on the mathematical thinking of self and others.** |
| **BENCHMARK** | **MA.K12.MTR.4.1** | **Engage in discussions that reflect on the mathematical thinking of self and others. Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:** |
| INDICATOR | MA.K12.MTR.4.1a | Communicate mathematical ideas, vocabulary and methods effectively. |
| INDICATOR | MA.K12.MTR.4.1b | Analyze the mathematical thinking of others. |
| INDICATOR | MA.K12.MTR.4.1c | Compare the efficiency of a method to those expressed by others. |
| INDICATOR | MA.K12.MTR.4.1d | Recognize errors and suggest how to correctly solve the task. |
| INDICATOR | MA.K12.MTR.4.1e | Justify results by explaining methods and processes. |
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 5: Use patterns and structure to help understand and connect mathematical concepts.** |
| **BENCHMARK** | **MA.K12.MTR.5.1** | **Use patterns and structure to help understand and connect mathematical concepts. Mathematicians who use patterns and structure to help understand and connect mathematical concepts:** |
| INDICATOR | MA.K12.MTR.5.1a | Focus on relevant details within a problem. |
| INDICATOR | MA.K12.MTR.5.1b | Create plans and procedures to logically order events, steps or ideas to solve problems. |
| INDICATOR | MA.K12.MTR.5.1c | Decompose a complex problem into manageable parts. |
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 6: Assess the reasonableness of solutions.** |

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| **BENCHMARK** | **MA.K12.MTR.6.1** | **Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions:** |
| INDICATOR | MA.K12.MTR.6.1c | Check calculations when solving problems. |
| INDICATOR | MA.K12.MTR.6.1d | Verify possible solutions by explaining the methods used. |
| INDICATOR | MA.K12.MTR.6.1e | Evaluate results based on the given context. |
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 7: Apply mathematics to real-world contexts.** |
| **BENCHMARK** | **MA.K12.MTR.7.1** | **Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts:** |
| INDICATOR | MA.K12.MTR.7.1a | Connect mathematical concepts to everyday experiences. |
| INDICATOR | MA.K12.MTR.7.1b | Use models and methods to understand, represent and solve problems. |
| INDICATOR | MA.K12.MTR.7.1c | Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. |

**Florida Standards**

**Mathematics**

Grade **8** - Adopted: **2020**

| | | |
|---|---|---|
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 1: Actively participate in effortful learning both individually and collectively.** |
| **BENCHMARK** | **MA.K12.MTR.1.1** | **Mathematicians who participate in effortful learning both individually and with others:** |
| INDICATOR | MA.K12.MTR.1.1a | Analyze the problem in a way that makes sense given the task. |
| INDICATOR | MA.K12.MTR.1.1b | Ask questions that will help with solving the task. |
| INDICATOR | MA.K12.MTR.1.1c | Build perseverance by modifying methods as needed while solving a challenging task. |
| INDICATOR | MA.K12.MTR.1.1d | Stay engaged and maintain a positive mindset when working to solve tasks. |
| INDICATOR | MA.K12.MTR.1.1e | Help and support each other when attempting a new method or approach. |
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |

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| **BIG IDEA** | | **Standard 2: Demonstrate understanding by representing problems in multiple ways.** |
| **BENCHMARK** | **MA.K12.MTR.2.1** | **Demonstrate understanding by representing problems in multiple ways. Mathematicians who demonstrate understanding by representing problems in multiple ways:** |
| INDICATOR | MA.K12.MTR.2.1a | Build understanding through modeling and using manipulatives. |
| INDICATOR | MA.K12.MTR.2.1b | Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. |
| INDICATOR | MA.K12.MTR.2.1d | Express connections between concepts and representations. |
| INDICATOR | MA.K12.MTR.2.1e | Choose a representation based on the given context or purpose. |
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 3: Complete tasks with mathematical fluency.** |
| **BENCHMARK** | **MA.K12.MTR.3.1** | **Complete tasks with mathematical fluency.Mathematicians who complete tasks with mathematical fluency:** |
| INDICATOR | MA.K12.MTR.3.1a | Select efficient and appropriate methods for solving problems within the given context. |
| INDICATOR | MA.K12.MTR.3.1b | Maintain flexibility and accuracy while performing procedures and mental calculations. |
| INDICATOR | MA.K12.MTR.3.1c | Complete tasks accurately and with confidence. |
| INDICATOR | MA.K12.MTR.3.1e | Use feedback to improve efficiency when performing calculations. |
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 4: Engage in discussions that reflect on the mathematical thinking of self and others.** |
| **BENCHMARK** | **MA.K12.MTR.4.1** | **Engage in discussions that reflect on the mathematical thinking of self and others. Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:** |
| INDICATOR | MA.K12.MTR.4.1a | Communicate mathematical ideas, vocabulary and methods effectively. |
| INDICATOR | MA.K12.MTR.4.1b | Analyze the mathematical thinking of others. |
| INDICATOR | MA.K12.MTR.4.1c | Compare the efficiency of a method to those expressed by others. |
| INDICATOR | MA.K12.MTR.4.1d | Recognize errors and suggest how to correctly solve the task. |

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| INDICATOR | MA.K12.MTR.4.1e | Justify results by explaining methods and processes. |

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| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 5: Use patterns and structure to help understand and connect mathematical concepts.** |
| **BENCHMARK** | **MA.K12.MTR.5.1** | **Use patterns and structure to help understand and connect mathematical concepts. Mathematicians who use patterns and structure to help understand and connect mathematical concepts:** |
| INDICATOR | MA.K12.MTR.5.1a | Focus on relevant details within a problem. |
| INDICATOR | MA.K12.MTR.5.1b | Create plans and procedures to logically order events, steps or ideas to solve problems. |
| INDICATOR | MA.K12.MTR.5.1c | Decompose a complex problem into manageable parts. |

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|---|---|---|
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 6: Assess the reasonableness of solutions.** |
| **BENCHMARK** | **MA.K12.MTR.6.1** | **Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions:** |
| INDICATOR | MA.K12.MTR.6.1c | Check calculations when solving problems. |
| INDICATOR | MA.K12.MTR.6.1d | Verify possible solutions by explaining the methods used. |
| INDICATOR | MA.K12.MTR.6.1e | Evaluate results based on the given context. |

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|---|---|---|
| **BODY OF KNOWLEDGE** | | **Mathematical Thinking and Reasoning** |
| **BIG IDEA** | | **Standard 7: Apply mathematics to real-world contexts.** |
| **BENCHMARK** | **MA.K12.MTR.7.1** | **Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts:** |
| INDICATOR | MA.K12.MTR.7.1a | Connect mathematical concepts to everyday experiences. |
| INDICATOR | MA.K12.MTR.7.1b | Use models and methods to understand, represent and solve problems. |
| INDICATOR | MA.K12.MTR.7.1c | Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. |

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| **BODY OF KNOWLEDGE** | | **Algebraic Reasoning** |
| **BIG IDEA** | | **Standard 1: Generate equivalent algebraic expressions.** |

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| BENCHMARK | MA.8.AR.1.3. | Rewrite the sum of two algebraic expressions having a common monomial factor as a common factor multiplied by the sum of two algebraic expressions. |

**Florida Standards**

**Science**

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

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|---|---|---|
| **BODY OF KNOWLEDGE** | **FL.SC.7.P.** | **Physical Science** |
| **BIG IDEA** | **SC.7.P.11.** | **Energy Transfer and Transformations - A. Waves involve a transfer of energy without a transfer of matter. B. Water and sound waves transfer energy through a material. C. Light waves can travel through a vacuum and through matter. D. The Law of Conservation of Energy: Energy is conserved as it transfers from one object to another and from one form to another.** |
| BENCHMARK | SC.7.P.11.2. | Investigate and describe the transformation of energy from one form to another. |

**Florida Standards**

**Science**

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

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|---|---|---|
| **BODY OF KNOWLEDGE** | **FL.SC.8.N.** | **Nature of Science** |
| **BIG IDEA** | **SC.8.N.1.** | **The Practice of Science - A: Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation. B: The processes of science frequently do not correspond to the traditional portrayal of ''the scientific method.'' C: Scientific argumentation is a necessary part of scientific inquiry and plays an important role in the generation and validation of scientific knowledge. D: Scientific knowledge is based on observation and inference; it is important to recognize that these are very different things. Not only does science require creativity in its methods and processes, but also in its questions and explanations.** |
| BENCHMARK | SC.8.N.1.6. | Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence. |

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| **BODY OF KNOWLEDGE** | **FL.SC.8.N.** | **Nature of Science** |
| **BIG IDEA** | **SC.8.N.4.** | **Science and Society - As tomorrows citizens, students should be able to identify issues about which society could provide input, formulate scientifically investigable questions about those issues, construct investigations of their questions, collect and evaluate data from their investigations, and develop scientific recommendations based upon their findings.** |
| BENCHMARK | SC.8.N.4.1. | Explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels. |
| BENCHMARK | SC.8.N.4.2. | Explain how political, social, and economic concerns can affect science, and vice versa. |

**Florida Standards**

**Technology Education**

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

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|---|---|---|
| **BODY OF KNOWLEDGE** | **FL.SC.68.CS-CS.** | **COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING** |
| **BIG IDEA** | **SC.68.CS-CS.2.** | **Problem solving and Algorithms** |
| BENCHMARK | SC.68.CS-CS.2.2 | Solve real-life issues in science and engineering (i.e., generalize a solution to open-ended problems) using computational thinking skills. |

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| BENCHMARK | SC.68.CS-CS.2.5 | Decompose a problem and create a function for one of its parts at a time (e.g., video game, robot obstacle course, making dinner), individually and collaboratively. |
| BENCHMARK | SC.68.CS-CS.2.6 | Create a program that implements an algorithm to achieve a given goal, individually and collaboratively. |
| **BODY OF KNOWLEDGE** | **FL.SC.68.CS-CS.** | **COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING** |
| **BIG IDEA** | **SC.68.CS-CS.6.** | **Human – Computer interactions and Artificial Intelligence** |
| BENCHMARK | SC.68.CS-CS.6.2 | Describe how humans and machines interact to accomplish tasks that cannot be accomplished by either alone. |

**Florida Standards**

**Technology Education**

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

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|---|---|---|
| **BODY OF KNOWLEDGE** | **FL.SC.68.CS-CS.** | **COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING** |
| **BIG IDEA** | **SC.68.CS-CS.2.** | **Problem solving and Algorithms** |
| BENCHMARK | SC.68.CS-CS.2.2 | Solve real-life issues in science and engineering (i.e., generalize a solution to open-ended problems) using computational thinking skills. |
| BENCHMARK | SC.68.CS-CS.2.5 | Decompose a problem and create a function for one of its parts at a time (e.g., video game, robot obstacle course, making dinner), individually and collaboratively. |
| BENCHMARK | SC.68.CS-CS.2.6 | Create a program that implements an algorithm to achieve a given goal, individually and collaboratively. |
| **BODY OF KNOWLEDGE** | **FL.SC.68.CS-CS.** | **COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING** |
| **BIG IDEA** | **SC.68.CS-CS.6.** | **Human – Computer interactions and Artificial Intelligence** |
| BENCHMARK | SC.68.CS-CS.6.2 | Describe how humans and machines interact to accomplish tasks that cannot be accomplished by either alone. |

**Georgia Standards of Excellence**

**Science**

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

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|---|---|---|
| **STRAND/TOPIC** | | **Physical Science** |
| **STANDARD / DESCRIPTION** | **S8P2.** | **Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system.** |
| ELEMENT | S8P2.c. | Construct an argument to support a claim about the type of energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)]. |

**Georgia Standards of Excellence**

**Technology Education**

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

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|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |

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| **STANDARD / DESCRIPTION** | | **Innovative Designer and Creator** |
| ELEMENT | CSS.IDC.6-8.18. | Recognize that there may be multiple approaches to solving a problem. |
| ELEMENT | CSS.IDC.6-8.19. | Approach problem solving iteratively, using a cyclical process. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Innovative Designer and Creator** |
| **ELEMENT** | **CSS.IDC.6-8.20.** | **Design, develop, debug and implement computer programs.** |
| ELEMENT/GLE | CSS.IDC.6-8.20.5. | Implement a simple algorithm in a computer program. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| ELEMENT/GLE | CSS.CT.6-8.30. | Identify sub-problems to consider while addressing a larger problem. |
| ELEMENT/GLE | CSS.CT.6-8.31. | Recognize when it is appropriate to solve a problem computationally; Make sense of computational problems and persevere in solving them. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.32.** | **Develop through application, logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life.** |
| EXPECTATION | CSS.CT.6-8.32.1. | Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking and abstraction). |
| EXPECTATION | CSS.CT.6-8.32.5. | Explain how technology can create ethical and legal issues in the business world and a technology-based society and how it can be used to solve & manage those issues. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.33.** | **Utilize computational thinking to solve problems.** |
| EXPECTATION | CSS.CT.6-8.33.3. | Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. |

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| EXPECTATION | CSS.CT.6-8.33.4. | Develop an algorithm to decompose a problem of a daily task. |

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| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| ELEMENT/GLE | CSS.CT.6-8.34. | Recognize when to use the same solution for multiple problems. |

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| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Algorithms** |
| **ELEMENT/GLE** | **CSS.CT.6-8.36.** | **Understand and use the basic steps in algorithmic problem solving in computing and other authentic applications.** |
| EXPECTATION | CSS.CT.6-8.36.1. | Select basic steps to solve algorithmic problems. |
| EXPECTATION | CSS.CT.6-8.36.2. | Evaluate basic steps of algorithmic problem solving to design solutions. |
| EXPECTATION | CSS.CT.6-8.36.3. | Solve algorithmic problems of increasing complexity. |

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| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.32.** | **Develop through application, logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life.** |
| EXPECTATION | CSS.CT.6-8.32.1. | Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking and abstraction). |
| EXPECTATION | CSS.CT.6-8.32.5. | Explain how technology can create ethical and legal issues in the business world and a technology-based society and how it can be used to solve & manage those issues. |

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| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.33.** | **Utilize computational thinking to solve problems.** |
| EXPECTATION | CSS.CT.6-8.33.3. | Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. |

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| EXPECTATION | CSS.CT.6-8.33.4. | Develop an algorithm to decompose a problem of a daily task. |

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| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| ELEMENT/GLE | CSS.CT.6-8.34. | Recognize when to use the same solution for multiple problems. |

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| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Algorithms** |
| **ELEMENT/GLE** | **CSS.CT.6-8.36.** | **Understand and use the basic steps in algorithmic problem solving in computing and other authentic applications.** |
| EXPECTATION | CSS.CT.6-8.36.1. | Select basic steps to solve algorithmic problems. |
| EXPECTATION | CSS.CT.6-8.36.2. | Evaluate basic steps of algorithmic problem solving to design solutions. |
| EXPECTATION | CSS.CT.6-8.36.3. | Solve algorithmic problems of increasing complexity. |

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| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Creative Communicator** |
| **ELEMENT** | | **Conceptual Category: Collaborating Around Computing** |
| ELEMENT/GLE | CSS.CT.6-8.41. | Use online resources to participate in collaborative activities for the purpose of developing solutions or products. |

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

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| **STRAND/TOPIC** | | **Foundations of Secure Information Systems (MS-CS-FSIS) (11.01100)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FSIS-1.** | **Demonstrate employability skills required by business and industry to explore, research, and present careers in information technology.** |
| ELEMENT | MS-CS-FSIS-1.4. | Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations. |

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| **STRAND/TOPIC** | | **Foundations of Secure Information Systems (MS-CS-FSIS) (11.01100)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FSIS-3.** | **Develop through application logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life.** |
| ELEMENT | MS-CS-FSIS-3.1. | Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking, and abstraction). |

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| ELEMENT | MS-CS-FSIS-3.2. | Explain issues and analyze routine hardware and software problems current to everyday life. |
| **STRAND/TOPIC** | | **Foundations of Computer Programming (MS-CS-FCP) (11.01200)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FCP-1.** | **Demonstrate employability skills required by business and industry and explore, research, and present careers in information technology.** |
| ELEMENT | MS-CS-FCP-1.4. | Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations. |
| **STRAND/TOPIC** | | **Foundations of Computer Programming (MS-CS-FCP) (11.01200)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FCP-3.** | **Utilize computational thinking to solve problems.** |
| ELEMENT | MS-CS-FCP-3.3. | Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. |
| ELEMENT | MS-CS-FCP-3.4. | Develop an algorithm to decompose a problem of a daily task. |
| **STRAND/TOPIC** | | **Foundations of Computer Programming (MS-CS-FCP) (11.01200)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FCP-4.** | **Design, develop, debug and implement computer programs.** |
| ELEMENT | MS-CS-FCP-4.5. | Implement a simple algorithm in a computer program. |
| **STRAND/TOPIC** | | **Foundations of Interactive Design (MS-CS-FID) (11.01300)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FID-1.** | **Demonstrate employability skills required by business and industry and explore, research, and present careers in information technology.** |
| ELEMENT | MS-CS-FID-1.4. | Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations. |

**Georgia Standards of Excellence**

**Technology Education**

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

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|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Innovative Designer and Creator** |
| ELEMENT | CSS.IDC.6-8.18. | Recognize that there may be multiple approaches to solving a problem. |
| ELEMENT | CSS.IDC.6-8.19. | Approach problem solving iteratively, using a cyclical process. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Innovative Designer and Creator** |
| **ELEMENT** | **CSS.IDC.6-8.20.** | **Design, develop, debug and implement computer programs.** |

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|---|---|---|
| ELEMENT/GLE | CSS.IDC.6-8.20.5. | Implement a simple algorithm in a computer program. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| ELEMENT/GLE | CSS.CT.6-8.30. | Identify sub-problems to consider while addressing a larger problem. |
| ELEMENT/GLE | CSS.CT.6-8.31. | Recognize when it is appropriate to solve a problem computationally; Make sense of computational problems and persevere in solving them. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.32.** | **Develop through application, logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life.** |
| EXPECTATION | CSS.CT.6-8.32.1. | Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking and abstraction). |
| EXPECTATION | CSS.CT.6-8.32.5. | Explain how technology can create ethical and legal issues in the business world and a technology-based society and how it can be used to solve & manage those issues. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.33.** | **Utilize computational thinking to solve problems.** |
| EXPECTATION | CSS.CT.6-8.33.3. | Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. |
| EXPECTATION | CSS.CT.6-8.33.4. | Develop an algorithm to decompose a problem of a daily task. |
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| ELEMENT/GLE | CSS.CT.6-8.34. | Recognize when to use the same solution for multiple problems. |

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|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science I (11.03000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Algorithms** |
| **ELEMENT/GLE** | **CSS.CT.6-8.36.** | **Understand and use the basic steps in algorithmic problem solving in computing and other authentic applications.** |
| EXPECTATION | CSS.CT.6-8.36.1. | Select basic steps to solve algorithmic problems. |
| EXPECTATION | CSS.CT.6-8.36.2. | Evaluate basic steps of algorithmic problem solving to design solutions. |
| EXPECTATION | CSS.CT.6-8.36.3. | Solve algorithmic problems of increasing complexity. |

| | | |
|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.32.** | **Develop through application, logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life.** |
| EXPECTATION | CSS.CT.6-8.32.1. | Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking and abstraction). |
| EXPECTATION | CSS.CT.6-8.32.5. | Explain how technology can create ethical and legal issues in the business world and a technology-based society and how it can be used to solve & manage those issues. |

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|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| **ELEMENT/GLE** | **CSS.CT.6-8.33.** | **Utilize computational thinking to solve problems.** |
| EXPECTATION | CSS.CT.6-8.33.3. | Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. |
| EXPECTATION | CSS.CT.6-8.33.4. | Develop an algorithm to decompose a problem of a daily task. |

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|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Recognizing and Defining Computational Problems** |
| ELEMENT/GLE | CSS.CT.6-8.34. | Recognize when to use the same solution for multiple problems. |

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|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Computational Thinker** |
| **ELEMENT** | | **Conceptual Category: Algorithms** |
| **ELEMENT/GLE** | **CSS.CT. 6-8.36.** | **Understand and use the basic steps in algorithmic problem solving in computing and other authentic applications.** |
| EXPECTATION | CSS.CT. 6-8.36.1. | Select basic steps to solve algorithmic problems. |
| EXPECTATION | CSS.CT. 6-8.36.2. | Evaluate basic steps of algorithmic problem solving to design solutions. |
| EXPECTATION | CSS.CT. 6-8.36.3. | Solve algorithmic problems of increasing complexity. |

| | | |
|---|---|---|
| **STRAND/TOPIC** | | **Middle School Computer Science II (11.04000)** |
| **STANDARD / DESCRIPTION** | | **Creative Communicator** |
| **ELEMENT** | | **Conceptual Category: Collaborating Around Computing** |
| ELEMENT/GLE | CSS.CT. 6-8.41. | Use online resources to participate in collaborative activities for the purpose of developing solutions or products. |

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

| | | |
|---|---|---|
| **STRAND/TOPIC** | | **Foundations of Secure Information Systems (MS-CS-FSIS) (11.01100)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FSIS-1.** | **Demonstrate employability skills required by business and industry to explore, research, and present careers in information technology.** |
| ELEMENT | MS-CS-FSIS-1.4. | Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations. |

| | | |
|---|---|---|
| **STRAND/TOPIC** | | **Foundations of Secure Information Systems (MS-CS-FSIS) (11.01100)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FSIS-3.** | **Develop through application logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life.** |
| ELEMENT | MS-CS-FSIS-3.1. | Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking, and abstraction). |
| ELEMENT | MS-CS-FSIS-3.2. | Explain issues and analyze routine hardware and software problems current to everyday life. |

| | | |
|---|---|---|
| **STRAND/TOPIC** | | **Foundations of Computer Programming (MS-CS-FCP) (11.01200)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FCP-1.** | **Demonstrate employability skills required by business and industry and explore, research, and present careers in information technology.** |
| ELEMENT | MS-CS-FCP-1.4. | Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations. |

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|---|---|---|
| **STRAND/TOPIC** | | **Foundations of Computer Programming (MS-CS-FCP) (11.01200)** |

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|---|---|---|
| **STANDARD / DESCRIPTION** | **MS-CS-FCP-3.** | **Utilize computational thinking to solve problems.** |
| ELEMENT | MS-CS-FCP-3.3. | Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. |
| ELEMENT | MS-CS-FCP-3.4. | Develop an algorithm to decompose a problem of a daily task. |
| **STRAND/TOPIC** | | **Foundations of Computer Programming (MS-CS-FCP) (11.01200)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FCP-4.** | **Design, develop, debug and implement computer programs.** |
| ELEMENT | MS-CS-FCP-4.5. | Implement a simple algorithm in a computer program. |
| **STRAND/TOPIC** | | **Foundations of Interactive Design (MS-CS-FID) (11.01300)** |
| **STANDARD / DESCRIPTION** | **MS-CS-FID-1.** | **Demonstrate employability skills required by business and industry and explore, research, and present careers in information technology.** |
| ELEMENT | MS-CS-FID-1.4. | Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations. |

**Hawaii Content and Performance Standards**

**Mathematics**

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

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|---|---|---|
| **CONTENT STANDARD / COURSE** | **HI.CC.MP.7.** | **Mathematical Practices** |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.7.1. | Make sense of problems and persevere in solving them. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.7.2. | Reason abstractly and quantitatively. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.7.3. | Construct viable arguments and critique the reasoning of others. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.7.4. | Model with mathematics. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.7.6. | Attend to precision. |

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| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.7.7. | Look for and make use of structure. |

**Hawaii Content and Performance Standards**

**Mathematics**

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

| CONTENT STANDARD / COURSE | HI.CC.MP.8. | Mathematical Practices |
|---|---|---|
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.8.1. | Make sense of problems and persevere in solving them. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.8.2. | Reason abstractly and quantitatively. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.8.3. | Construct viable arguments and critique the reasoning of others. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.8.4. | Model with mathematics. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.8.6. | Attend to precision. |
| STANDARD / PERFORMANCE INDICATOR / DOMAIN | MP.8.7. | Look for and make use of structure. |

**Hawaii Content and Performance Standards**

**Science**

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

| CONTENT STANDARD / COURSE | NGSS.MS-ESS. | EARTH AND SPACE SCIENCE |
|---|---|---|
| **STANDARD / PERFORMANCE INDICATOR / DOMAIN** | **MS-ESS3.** | **Earth and Human Activity** |
| **INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK** | | **Students who demonstrate understanding can:** |

| | | |
|---|---|---|
| EXPECTATION / TOPIC | MS-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |
| EXPECTATION / TOPIC | MS-ESS3-3. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. |
| EXPECTATION / TOPIC | 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. |
| EXPECTATION / TOPIC | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |
| **CONTENT STANDARD / COURSE** | **NGSS.MS-ETS.** | **ENGINEERING DESIGN** |
| **STANDARD / PERFORMANCE INDICATOR / DOMAIN** | **MS-ETS1.** | **Engineering Design** |
| **INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK** | | **Students who demonstrate understanding can:** |
| EXPECTATION / TOPIC | MS-ETS1-1. | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| EXPECTATION / TOPIC | MS-ETS1-2. | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |
| EXPECTATION / TOPIC | MS-ETS1-4. | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |

**Hawaii Content and Performance Standards**

**Science**

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

| | | |
|---|---|---|
| **CONTENT STANDARD / COURSE** | **NGSS.MS-ESS.** | **EARTH AND SPACE SCIENCE** |
| **STANDARD / PERFORMANCE INDICATOR / DOMAIN** | **MS-ESS3.** | **Earth and Human Activity** |
| **INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK** | | **Students who demonstrate understanding can:** |
| EXPECTATION / TOPIC | MS-ESS3-1. | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |
| EXPECTATION / TOPIC | MS-ESS3-3. | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. |

| | | |
|---|---|---|
| EXPECTATION / TOPIC | 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. |
| EXPECTATION / TOPIC | MS-ESS3-5. | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |
| **CONTENT STANDARD / COURSE** | **NGSS.MS-ETS.** | **ENGINEERING DESIGN** |
| **STANDARD / PERFORMANCE INDICATOR / DOMAIN** | **MS-ETS1.** | **Engineering Design** |
| **INDICATOR / GRADE LEVEL EXPECTATION / BENCHMARK** | | **Students who demonstrate understanding can:** |
| EXPECTATION / TOPIC | MS-ETS1-1. | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| EXPECTATION / TOPIC | MS-ETS1-2. | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |
| EXPECTATION / TOPIC | MS-ETS1-4. | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |