PLTW Launch Standards Connection
Fifth Grade

Connections to Standards in PLTW Launch

PLTW curriculum is designed to empower students to thrive in an evolving world. As a part of the design process when developing and updating our curriculum, we focus on connections to a variety of standards. PLTW Launch modules connect to standards in the following:

Next Generation Science Standards

Matter and Its Interactions

5-PS1-1
Develop a model to describe that matter is made of particles too small to be seen.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

5-PS1-2
Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
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- ☐ Earth’s Water and Interconnected Systems

5-PS1-3
Make observations and measurements to identify materials based on their properties.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
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5-PS1-4
Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Next Generation Science Standards

Motion and Stability: Forces and Interactions

5-PS2-1
Support an argument that the gravitational force exerted by Earth on objects is directed down.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
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- ☐ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Energy

5-PS3-1
Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
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- ☐ Matter: Properties and Reactions
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- ☐ Earth's Water and Interconnected Systems

From Molecules to Organisms: Structures and Processes

5-LS1-1
Support an argument that plants get the materials they need for growth chiefly from air and water.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
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- ☐ Earth's Water and Interconnected Systems

Ecosystems: Interactions, Energy, and Dynamics

5-LS2-1
Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Next Generation Science Standards

Earth's Place in the Universe

5-ESS1-1
Support an argument that differences in the apparent brightness of the Sun compared to other stars is due to their relative distances from Earth.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
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- ☐ Earth's Water and Interconnected Systems

5-ESS1-2
Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Earth's Systems

5-ESS2-1
Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
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- ☑ Earth's Water and Interconnected Systems

5-ESS2-2
Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
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- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Next Generation Science Standards

Earth and Human Activity

5-ESS3-1
Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

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- ☐ Infection: Detection
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- ☐ Matter: Properties and Reactions
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- ☐ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Engineering Design

3-5-ETS1-1
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

3-5-ETS1-2
Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
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- ☑ Earth's Water and Interconnected Systems

3-5-ETS1-3
Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
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Next Generation Science Standards

Science and Engineering Practices

Asking Questions and Defining Problems

Asking questions and defining problems in 3–5 builds on K–2 experiences and progresses to specifying qualitative relationships.

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Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

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Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
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Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

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Next Generation Science Standards

Using Mathematics and Computational Thinking

Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

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Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
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Engaging in Argument from Evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

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Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

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Disciplinary Core Ideas (3-5)

Physical Science

PS1.A Structure and Properties of Matter

• Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.

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PS1.A Structure and Properties of Matter

• The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.

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- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
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- ☑ Matter: Properties and Reactions
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PS1.A Structure and Properties of Matter

• Measurements of a variety of properties can be used to identify materials.

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- ☐ Robotics and Automation: Challenge
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PS1.B Chemical Reactions

• When two or more different substances are mixed, a new substance with different properties may be formed.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
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Next Generation Science Standards

PS1.B Chemical Reactions

• No matter what reaction or change in properties occurs, the total weight of the substances does not change.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
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PS2.B Types of Interactions

• The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center.

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PS3.D Energy in Chemical Processes and Everyday Life

• The energy released [from] food was once energy from the Sun that was captured by plants in the chemical process that forms plant matter (from air and water).

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Life Science

LS1.C Organization for Matter and Energy Flow in Organisms

• Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and motion.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
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Next Generation Science Standards

LS1.C Organization for Matter and Energy Flow in Organisms

• Plants acquire their material for growth chiefly from air and water.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
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LS2.A Interdependent Relationships in Ecosystems

• The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.

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LS2.B Cycles of Matter and Energy Transfer in Ecosystems

• Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases and water from the environment and release waste matter (gas, liquid, or solid) back into the environment.

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Earth and Space Science

ESS1.A The Universe and its Stars

• The Sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth.

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- ☐ Robotics and Automation: Challenge
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Next Generation Science Standards

ESS1.B Earth and the Solar System

• The orbits of Earth around the Sun and the Moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the Sun, Moon, and stars at different times of the day, months, and year.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
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ESS2.A Earth Materials and Systems

• Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.

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ESS2.C The Roles of Water in Earth's Surface Processes

• Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.

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ESS3.C Human Impacts on Earth Systems

• Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

- ☑ Robotics and Automation
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Next Generation Science Standards

Engineering, Technology, and Applications of Science

ETS1.A Defining and Delimiting Engineering Problems

• Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.

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ETS1.B Developing Possible Solutions

• Research on a problem should be carried out before beginning to design a solution.

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ETS1.B Developing Possible Solutions

• At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.

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ETS1.B Developing Possible Solutions

• Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.

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Next Generation Science Standards

ETS1.C Optimizing the Design Solution

• Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

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Crosscutting Concepts (3-5)

Patterns – Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

• Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena and designed products.

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Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

• Cause and effect relationships are routinely identified, tested, and used to explain change.

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Scale, Proportion, and Quantity – In considering phenomena, it is critical to recognize what is relevant at different size, time, and energy scales, and to recognize proportional relationships between different quantities as scales change.

• Natural objects and/or observable phenomena exist from very short to very long time periods.

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Next Generation Science Standards

• Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

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Systems and System Models – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

• A system is a group of related parts that make up a whole and can carry out functions its individual parts cannot.

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• A system can be described in terms of its components and their interactions.

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Energy and Matter: Flows, Cycles, and Conservation – Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.

• Matter flows and cycles can be tracked in terms of the weight of the substances before and after a process occurs. The total weight of the substances does not change. This is what is meant by conservation of matter. Matter is transported into, out of, and within systems.

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Next Generation Science Standards

• Energy can be transferred in various ways and between objects.

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Structure and Function – The way an object is shaped or structured determines many of its properties and functions

• Different materials have different substructures, which can sometimes be observed.

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- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

• Substructures have shapes and parts that serve functions.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Connections to Engineering, Technology, and Applications of Science (3-5)

Influence of Science, Engineering, and Technology on Society and the Natural World

• People's needs and wants change over time, as do their demands for new and improved technologies.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Next Generation Science Standards

• Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth's Water and Interconnected Systems

Connections to the Nature of Science (3-5)

Science Addresses Questions About the Natural and Material World

• Science findings are limited to what can be answered with empirical evidence.

- [x] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [ ] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth's Water and Interconnected Systems

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

• Science assumes consistent patterns in natural systems.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [ ] Infection: Modeling and Simulation
- [x] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth's Water and Interconnected Systems

Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena

• Science explanations describe the mechanisms for natural events.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [ ] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth's Water and Interconnected Systems

Next Generation Science Standards

Scientific Investigations Use a Variety of Methods

- Science investigations use a variety of methods, tools, and techniques.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Computer Science Teachers Association K-12 Computer Science

In Spring 2023 PLTW submitted all necessary documentation required by the Computer Science Teachers Association (CSTA) for a crosswalk review of our Launch and Gateway curricula by the CSTA Standards Review Team. While we anticipate approval and validation by CSTA, the review is pending.

Computing Systems

Devices

1B-CS-01
Describe how internal and external parts of computing devices function to form a system.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Hardware & Software

1B-CS-02
Model how computer hardware and software work together as a system to accomplish tasks.

- ☑ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Troubleshooting

1B-CS-03
Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Networks and the Internet

Cybersecurity

1B-NI-05

Discuss real-world cybersecurity problems and how personal information can be protected.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Data and Analysis

Storage

1A-DA-05

Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.

- ☑ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Collection Visualization & Transformation

1B-DA-06

Organize and present collected data visually to highlight relationships and support a claim.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Inference & Models

1B-DA-07

Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.

- ☑ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Algorithms and Programming

Algorithms

1B-AP-08

Compare and refine multiple algorithms for the same task and determine which is the most appropriate.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Variables

1B-AP-09

Create programs that use variables to store and modify data.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Control

1B-AP-10

Create programs that include sequences, events, loops, and conditionals.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Modularity

1B-AP-11

Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Computer Science Teachers Association K-12 Computer Science

Modularity

1B-AP-12

Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Program Development

1B-AP-13

Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Program Development

1B-AP-14

Observe intellectual property rights and give appropriate attribution when creating or remixing programs.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Program Development

1B-AP-15

Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Computer Science Teachers Association K-12 Computer Science

Program Development

1B-AP-16

Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Program Development

1B-AP-17

Describe choices made during program development using code comments, presentations, and demonstrations.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Impacts of Computing

Culture

1B-IC-18

Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Culture

1B-IC-19

Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Computer Science Teachers Association K-12 Computer Science

Social Interactions

1B-IC-20
Seek diverse perspectives for the purpose of improving computational artifacts.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Safety Law & Ethics

1B-IC-21
Use public domain or creative commons media, and refrain from copying or using material created by others without permission.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

International Society for Technology in Education Standards for Students

Empowered Learner

1a
Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

1c
Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

1d
Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Digital Citizen

2a
Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

International Society for Technology in Education Standards for Students

2b
Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

2c
Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

2d
Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Knowledge Constructor

3a
Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

International Society for Technology in Education Standards for Students

3c
Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

3d
Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Innovative Designer

4a
Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

4b
Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

International Society for Technology in Education Standards for Students

4c
Students develop, test and refine prototypes as part of a cyclical design process.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth’s Water and Interconnected Systems

4d
Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth’s Water and Interconnected Systems

Computational Thinker

5a
Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth’s Water and Interconnected Systems

5b
Students 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.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth’s Water and Interconnected Systems

International Society for Technology in Education Standards for Students

5c
Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

5d
Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Creative Communicator

6a
Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

6b
Students create original works or responsibly repurpose or remix digital resources into new creations.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

International Society for Technology in Education Standards for Students

6c
Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

6d
Students publish or present content that customizes the message and medium for their intended audiences.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Global Collaborator

7a
Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

7b
Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

International Society for Technology in Education Standards for Students

7c

Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth’s Water and Interconnected Systems

7d

Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth’s Water and Interconnected Systems

Reading Informational Text Standards

Key Ideas and Details

CCSS.ELA-LITERACY.RI.5.1
Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [ ] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [x] Patterns in the Universe
- [ ] Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.RI.5.2
Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.RI.5.3
Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [x] Infection: Detection
- [ ] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [x] Earth's Water and Interconnected Systems

Craft and Structure

CCSS.ELA-LITERACY.RI.5.4
Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [x] Patterns in the Universe
- [x] Earth's Water and Interconnected Systems

Common Core State Standards English Language Arts - Fifth Grade

Integration of Knowledge and Ideas

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.RI.5.8

Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.RI.5.9

Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Range of Reading and Level of Text Complexity

CCSS.ELA-LITERACY.RI.5.10

By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4-5 text complexity band independently and proficiently.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Writing Standards

Text Types and Purposes

CCSS.ELA-LITERACY.W.5.1
Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Text Types and Purposes

CCSS.ELA-LITERACY.W.5.2
Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

CCSS.ELA-LITERACY.W.5.2.D
Use precise language and domain-specific vocabulary to inform about or explain the topic.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Production and Distribution of Writing

CCSS.ELA-LITERACY.W.5.4
Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Common Core State Standards English Language Arts - Fifth Grade

Research to Build and Present Knowledge

CCSS.ELA-LITERACY.W.5.7

Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.W.5.8

Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.W.5.9

Draw evidence from literary or informational texts to support analysis, reflection, and research.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Speaking and Listening Standards

Comprehension and Collaboration

CCSS.ELA-LITERACY.SL.5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Common Core State Standards English Language Arts - Fifth Grade

CCSS.ELA-LITERACY.SL.5.2
Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.SL.5.4
Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

CCSS.ELA-LITERACY.SL.5.5
Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Common Core State Standards Mathematics - Fifth Grade

Operations and Algebraic Thinking

Write and interpret numerical expressions.

CCSS.MATH.CONTENT.5.OA.A.1
Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Number and Operations in Base Ten

Understand the place value system.

CCSS.MATH.CONTENT.5.NBT.A.2
Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

CCSS.MATH.CONTENT.5.NBT.A.3
Read, write, and compare decimals to thousandths.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

CCSS.MATH.CONTENT.5.NBT.A.4
Use place value understanding to round decimals to any place.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Common Core State Standards Mathematics - Fifth Grade

Perform operations with multi-digit whole numbers and with decimals to hundredths.

CCSS.MATH.CONTENT.5.NBT.B.5
Fluently multiply multi-digit whole numbers using the standard algorithm.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☑ Earth’s Water and Interconnected Systems

CCSS.MATH.CONTENT.5.NBT.B.6
Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Measurement and Data

Represent and interpret data.

CCSS.MATH.CONTENT.5.MD.B.2
Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☐ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth’s Water and Interconnected Systems

Common Core State Standards Mathematics - Fifth Grade

Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

CCSS.MATH.CONTENT.5.MD.C.3

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

CCSS.MATH.CONTENT.5.MD.C.4

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

- ☐ Robotics and Automation
- ☐ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☐ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☐ Ecosystems: Flow of Matter and Energy
- ☐ Patterns in the Universe
- ☐ Earth's Water and Interconnected Systems

Mathematical Practices

CCSS.MATH.PRACTICE.MP1

Make sense of problems and persevere in solving them.

- ☑ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☑ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

CCSS.MATH.PRACTICE.MP2

Reason abstractly and quantitatively.

- ☐ Robotics and Automation
- ☑ Robotics and Automation: Challenge
- ☐ Infection: Detection
- ☑ Infection: Modeling and Simulation
- ☑ Matter: Properties and Reactions
- ☑ Ecosystems: Flow of Matter and Energy
- ☑ Patterns in the Universe
- ☑ Earth's Water and Interconnected Systems

Common Core State Standards Mathematics - Fifth Grade

CCSS.MATH.PRACTICE.MP3
Construct viable arguments and critique the reasoning of others.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [x] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [x] Patterns in the Universe
- [x] Earth's Water and Interconnected Systems

CCSS.MATH.PRACTICE.MP4
Model with mathematics.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [x] Infection: Modeling and Simulation
- [x] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [x] Patterns in the Universe
- [x] Earth's Water and Interconnected Systems

CCSS.MATH.PRACTICE.MP5
Use appropriate tools strategically.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [x] Infection: Modeling and Simulation
- [x] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [x] Earth's Water and Interconnected Systems

CCSS.MATH.PRACTICE.MP6
Attend to precision.

- [x] Robotics and Automation
- [x] Robotics and Automation: Challenge
- [x] Infection: Detection
- [x] Infection: Modeling and Simulation
- [x] Matter: Properties and Reactions
- [x] Ecosystems: Flow of Matter and Energy
- [x] Patterns in the Universe
- [x] Earth's Water and Interconnected Systems

CCSS.MATH.PRACTICE.MP8
Look for and express regularity in repeated reasoning.

- [ ] Robotics and Automation
- [ ] Robotics and Automation: Challenge
- [ ] Infection: Detection
- [x] Infection: Modeling and Simulation
- [ ] Matter: Properties and Reactions
- [ ] Ecosystems: Flow of Matter and Energy
- [ ] Patterns in the Universe
- [ ] Earth's Water and Interconnected Systems

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