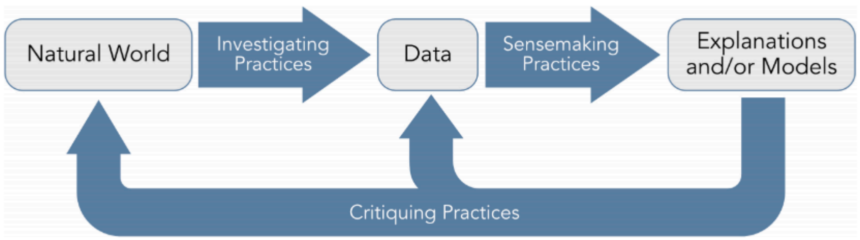
Revised: 5/9/24

BCS Grade 6 Science Curriculum 2024-2025

Core Idea 1: Light & Matter	Core Idea 2: Thermal Energy	Core Idea 3: Weather, Climate & Water Cycling	Core Idea 4: Plate Tectonics & Rock Cycling	Core Idea 5: Natural Hazards	Core Idea 6: Cells and Systems
4 weeks	**7 weeks**	**9 weeks**	**5 weeks**	**5 weeks**	**5 weeks**
Prioritized Standards **Developed:** -Asking Questions and Defining Problems -Developing and Using Models -Constructing Explanations and Designing Solutions **Key Use** **Supporting:** • 6-PS4-2* • 6-LS1-8* * partially developed in this unit	**Prioritized Standards** **Developed:** -Developing and Using Models -Planning and Carrying Out Investigations -Analyzing and Interpreting Data -Constructing Explanations and Designing Solutions **Key Use** -Engaging in Argument from Evidence -Asking Questions and Defining Problems **Supporting:** • 6-PS1-4* • 6-PS3-3 • 6-PS3-4 • 6-PS3-5 • 6-PS4-2* * partially developed in this unit	**Prioritized Standards** **Developed:** -Developing and Using Models -Planning and Carrying Out Investigations -Analyzing and Interpreting Data -Constructing Explanations and Designing Solutions **Key Use** -Asking Questions and Defining Problems -Using Mathematics and Computational Thinking -Obtaining, Evaluating, and Communicating Information **Supporting:** • 6-ESS2-4 • 6-ESS2-5 • 6-ESS2-6 • 6-PS1-4* * partially developed in this unit	**Prioritized Standards** **Developed:** -Developing and Using Models -Constructing Explanations and Designing Solutions -Analyzing and Interpreting Data **Key Use** -Asking Questions and Defining Problems -Using Mathematics and Computational Thinking -Engaging in Argument from Evidence **Supporting:** • 6-ESS2-1 • 6-ESS2-2 • 6-ESS2-3 • 6-ESS1-4	**Prioritized Standards** **Developed:** -Engaging in Argument from Evidence -Obtaining, Evaluating, and Communicating Information -Using Mathematics and Computational Thinking **Key Use** -Developing and Using Models -Analyzing and Interpreting Data -Constructing Explanations and Designing Solutions **Supporting:** • 6-ESS3-2 • 6-PS4-3	**Prioritized Standards** **Developed:** -Analyzing and Interpreting Data -Developing and Using Models **Key Use** -Planning and Carrying Out Investigations -Constructing Explanations and Designing Solutions -Engaging in Argument from Evidence -Obtaining, Evaluating, and Communicating Information **Supporting:** • 6-LS1-1 • 6-LS1-2* • 6-LS1-3* • 6-LS1-8* * partially developed in this unit

Science & Engineering Practices

The following are all skills that should be practiced regularly in the course of daily instruction and should, therefore, be embedded in every unit. These inquiry skills work together to give students a content-driven foundation to communicate conclusions at the end of each unit.



	Investigating Practices	Sensemaking Practices	Critiquing Practices
Science Practices	1. Asking questions	2. Developing and using models	7. Engaging in argument from evidence
	3. Planning and carrying out investigations	4. Analyzing and interpreting data	8. Obtaining, evaluating, and communication information
	5. Using mathematical and computational thinking	6. Constructing explanations	

Asking Questions & Defining Problems	Asking questions and defining problems in 6–8 builds on K–5 experiences and progresses to specifying relationships between variables, clarify arguments and models.
Developing & Using Models	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
Planning & Carrying Out Investigations	Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.
Analyzing & Interpreting Data	Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.
Using Mathematical & Computational Thinking	Mathematical and computational thinking in 6–8 builds on K–5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments.
Constructing Explanations & Designing Solutions	Constructing explanations and designing solutions in 68 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

Engaging in Argument From Evidence	Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).
Obtaining, Evaluating, & Communicating Information	Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.

Science and Engineering Practices Matrix (Elements of the SEPs)

Core Idea 1: Light and Matter (4 weeks)

Essential Question: Why do we sometimes see different things when looking at the same object?

Required Resources: OpenSciEd 6.1

Priority Practices:

Asking Questions & Defining Problems	Asking questions and defining problems in 6–8 builds on K–5 experiences and progresses to specifying relationships between variables, clarify arguments and models.
Developing & Using Models	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
Constructing Explanations & Designing Solutions	Constructing explanations and designing solutions in 68 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

Performance Expectations, DCI & CCC Components:

P.E.	DCI Component	CCC Component
6-PS4-2*	**PS4.A: Wave Properties** A sound wave needs a medium through which it is transmitted. **PS4.B: Electromagnetic Radiation** When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends. A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. However, because light can travel through space, it cannot be a matter wave, like sound or water waves.	**Structure and Function** Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.

6-LS1-8*	**LS1.D: Information Processing** Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.	**Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural systems.

*PE partially developed

Core Idea 2: Thermal Energy (7 weeks)

Essential Question: How can containers keep stuff from warming up or cooling down?

Required Resources: OpenSciEd 6.2

Priority Practices:

Developing & Using Models	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
Planning & Carrying Out Investigations	Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.
Analyzing & Interpreting Data	Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.
Constructing Explanations & Designing Solutions	Constructing explanations and designing solutions in 68 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

The following practices are also key to the sensemaking in this unit:

Asking questions and defining problems

Engaging in Argument from Evidence

Performance Expectations, DCI & CCC Components:

P.E.	DCI Component	CCC Component
6-PS1-4*	**PS1.A: Structure and Properties of Matter** Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. **PS3.A: Definitions of Energy** The term "heat" as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system's material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material.	**Cause and Effect** Cause-and-effect relationships may be used to predict phenomena in natural or designed systems.
6-PS3-3	**PS3.A: Definitions of Energy** Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present.	**Energy and Matter** The transfer of energy can be tracked as energy flows through a designed or natural system.

	PS3.B: Conservation of Energy and Energy Transfer Energy is spontaneously transferred out of hotter regions or objects and into colder ones. **ETS1.A: Defining and Delimiting an Engineering Problem** The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. **ETS1.B: Developing Possible Solutions** A solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and	
6-PS3-4	**PS3.A: Definitions of Energy** Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. **PS3.B: Conservation of Energy and Energy Transfer** The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment.	**Scale, Proportion, and Quantity** Proportional relationships (e.g., speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes.
6-PS3-5	**PS3.B: Conservation of Energy and Energy Transfer** When the motion energy of an object changes, there is inevitably some other change in energy at the same time.	**Energy and Matter** Energy may take different forms (e.g., energy in fields, thermal energy, energy of motion).
6-PS4-2*	**PS4.A: Wave Properties** A sound wave needs a medium through which it is transmitted. **PS4.B: Electromagnetic Radiation** When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path	**Structure and Function** Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.

	bends. A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. However, because light can travel through space, it cannot be a matter wave, like sound or water waves.	

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Core Idea 3: Weather, Climate and Water Cycling (9 weeks)

Essential Question: Why does a lot of hail, rain or snow fall at sometimes and not others?

Required Resources: Open Sci-Ed Unit 6.3

Priority Practices:

Developing & Using Models	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
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The following practices are also key to the sensemaking in this unit:

Asking questions and defining problems
Obtaining, Evaluating, and Communicating Information
Using Mathematical & Computational Thinking

Performance Expectations, DCI & CCC Components:

P.E.	DCI Component	CCC Component
6-ESS2-4	**ESS2.C: The Roles of Water in Earth's Surface Processes** Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. Global movements of water and its changes in form are propelled by sunlight and gravity.	**Energy and Matter** Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter.
6-ESS2-5	**ESS2.C: The Roles of Water in Earth's Surface Processes** The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. **ESS2.D: Weather and Climate** Because these patterns are so complex, weather can only be predicted probabilistically.	**Cause and Effect** Cause-and-effect relationships may be used to predict phenomena in natural or designed systems.
6-ESS2-6	**ESS2.C: The Roles of Water in Earth's Surface Processes** Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. **ESS2.D: Weather and Climate** Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents.	**Systems and System Models** Models can be used to represent systems and their interactions—such as inputs, processes and outputs— and energy, matter, and information flows within systems.
6-PS1-4*	**PS1.A: Structure and Properties of Matter** Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. The changes of state that occur with variations in temperature or pressure can be described and predicted	**Cause and Effect** Cause-and-effect relationships may be used to predict phenomena in natural or designed systems.

	using these models of matter. **PS3.A: Definitions of Energy** The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system’s material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system’s total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material.	

*PE partially developed

Core Idea 4: Plate Tectonics and Rock Cycling (6 weeks)

Essential Question: What causes Earth’s surface to change?

Required Resources: Open Sci-Ed 6.4

Priority Practices:

Developing & Using Models	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
Constructing Explanations & Designing Solutions	Constructing explanations and designing solutions in 68 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

Analyzing & Interpreting Data	Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

The following practices are also key to the sensemaking in this unit:

Asking questions and defining problems
Engaging in Argument from Evidence
Using Mathematical & Computational Thinking

Performance Expectations, DCI & CCC Components:

P.E.	DCI Component	CCC Component
6-ESS2-1	**ESS2.A: Earth's Materials and Systems** All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms.	**Stability and Change** Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.
6-ESS2-2	**ESS2.A: Earth's Materials and Systems** The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. **ESS2.C: The Roles of Water in Earth's Surface** Processes Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. **ESS2.E: Biogeology** The evolution and proliferation of living things over geological time have in turn changed the rates of weathering and erosion of land surfaces, altered the composition of Earth's soils and atmosphere, and affected the distribution of water in the hydrosphere.	**Scale, Proportion, and Quantity** Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

6-ESS2-3	**ESS1.C: The History of Planet Earth** Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. **ESS2.B: Plate Tectonics and Large-Scale System Interactions** Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.	**Patterns** Patterns in rates of change and other numerical relationships can provide information about natural systems.
6-ESS1-4	**ESS1.C: The History of Planet Earth** The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.	**Scale Proportion and Quantity** Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

Core Idea 5: Natural Hazards (5 weeks)

Essential Question: Where do natural hazards happen and how do we prepare for them?

Required Resources: [OpenSciEd 6.5]

Priority Practices:

Engaging in Argument From Evidence	Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).
Obtaining, Evaluating, & Communicating Information	Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.
Using Mathematical & Computational Thinking	Mathematical and computational thinking in 6–8 builds on K–5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments.

The following practices are also key to the sensemaking in this unit:

Developing and Using Models
Analyzing and Interpreting Data
Constructing Explanations and Designing Solutions

Performance Expectations, DCI & CCC Components:

P.E.	DCI Component	CCC Component
6-ESS3-2	**ESS3.B: Natural Hazards** Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events.	**Patterns** Graphs, charts, and images can be used to identify patterns in data.
6-PS4-3	**PS4.C: Information Technologies and Instrumentation** Technologies allow us to detect and interpret waves and signals in waves that cannot be detected directly.	**Structure and Function** Structures can be designed to serve particular functions.

Core Idea 6: Cells and Systems (5 weeks)

Essential Question: How do living things heal?

Required Resources: OpenSciEd 6.6

Priority Practices:

Developing & Using Models	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
Analyzing & Interpreting Data	Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

The following practices are also key to the sensemaking in this unit:

Planning and Carrying Out Investigations
Engaging in Argument from Evidence

Constructing Explanations and Designing Solutions
Obtaining, Evaluating, and Communicating Information

Performance Expectations, DCI & CCC Components:

P.E.	DCI Component	CCC Component
6-LS1-1	**LS1.A: Structure and Function** All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).	**Scale, Proportion, and Quantity** Phenomena that can be observed at one scale may not be observable at another scale.
6-LS1-2*	**LS1.A: Structure and Function** Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.	**Structure and Function** Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural and designed structures/systems can be analyzed to determine how they function.
6-LS1-3*	**LS1.A: Structure and Function** In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.	**Systems and System Models** Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems.
6-LS1-8*	**LS1.D: Information Processing** Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.	**Cause and Effect** Cause-and-effect relationships may be used to predict phenomena in natural systems.

*PE partially developed

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