



Elementary Curriculum Maps	Middle Level Curriculum Maps	High School Curriculum Maps
<ul style="list-style-type: none"><li>- <a href="#">Kindergarten</a></li><li>- <a href="#">1st Grade</a></li><li>- <a href="#">2nd Grade</a></li><li>- <a href="#">3rd Grade</a></li><li>- <a href="#">4th Grade</a></li><li>- <a href="#">5th Grade</a></li></ul>	<ul style="list-style-type: none"><li>- <a href="#">6th Grade</a></li><li>- <a href="#">7th Grade</a></li><li>- <a href="#">8th Grade</a></li></ul>	<ul style="list-style-type: none"><li>- <a href="#">High School Earth Science</a></li><li>- <a href="#">High School Biology</a></li><li>- <a href="#">High School Chemistry</a></li><li>- <a href="#">High School Physics</a></li></ul>

### How to Read the Curriculum Maps:

Each curriculum map is organized with the same components: Essential Question, Transferable Skill Priority Performance Indicator, Content Priority Performance Indicator, IRIS Priority Performance Indicator, Summative Assessment and Unit Content Topics. The maps are designed for adaptation and personalization for your own community context, which is why you will see the summative assessment spaces blank. Our goal was not to create a curriculum to be wholesale adopted, but a curriculum to inspire reflection on how to weave together some of the guiding documents used across Vermont while centering educational equity from the beginning of the curricular design process.

### What to look out for:

In recognition of the variability of social studies and science opportunities at the elementary levels across Vermont, we mapped out four units for both social studies and science K-5 that are designed to stand alone or be a companion unit to ELA or Math. These units are labeled accordingly within the maps. The Elementary Curriculum Maps are specially designed to align the Transferable Skills and IRIS standards across content areas and grade levels. Each grade/course level's map has a model unit overview linked within the map. Some unit overviews also include a comprehensive unit plan, which has been developed by Vermont educators and will be identified with an asterisk (\*). Some units will have updated content Proficiency Scales as they are published by the Vermont Agency of Education.



Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<p><b>#2 How can we use what we know about sunlight to help our community grow healthier gardens or create spaces where people can enjoy nature?</b></p> <p>(Companion to Math Unit 2)</p>	<p><b>4. Responsible and Involved Citizenship A.</b> Participate in and contribute to the enhancement of community life.</p>	<p><b>3. Energy and Matter C.</b> Make observations to determine the effect of sunlight on Earth's surface. K-PS3-1</p>	<p><b>1. Identity Development. C.</b> Share their lived experiences, their gifts, dreams, stories and languages, indigeneity, immigration journeys and/or ancestral lineages while honoring the lived experiences of all</p>		<p><b>Topics:</b> Observing sunlight and shadows, sunlight and temperature, sunlight's role in nature and protection from the sun, day and night cycle, comparing sunlit and shaded areas</p>
<p><b>#3 How do the ways animals and plants survive help us think about how we can work together to solve problems?</b></p> <p>(Companion to Math Unit 3)</p>	<p><b>5. Informed and Integrative Thinking A.</b> Apply knowledge from various disciplines and contexts to real life situations.</p>	<p><b>1. Structure and Function C.</b> Identify mechanisms that plants and animals use to survive; design a solution to a human problem by mimicking a survival mechanism that enables animals and plants to survive, grow, and meet their needs. K-LS1-1</p>	<p><b>1. Identity Development. D.</b> Value storytelling as a way to foster empathy and to understand the importance of mutual interdependence, relationality, and kinship</p>		<p><b>Topics:</b> Basic needs of plants and animals, animal and plant structures and features, (Biomimicry) problem-solving through nature-inspired design observation and inquiry skills</p>

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<p><b><u><a href="#">#6 What would happen if a community does not have access to healthy food, clean water, or safe places to live?</a></u></b></p> <p>(Companion to Math Unit 6)</p>	<p><b>5. Informed and Integrative Thinking A.</b> Apply knowledge from various disciplines and contexts to real life situations.</p>	<p><b>4. Systems and System Models A.</b> Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. K-ESS3-1</p>	<p><b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont</p>		<p><b>Topics:</b> How animals and plants depend on their environment human dependence on natural resources changes in the environment and their effects using models to show relationships.</p>
<p><b>#7 How can we design something that helps people feel more connected?</b></p> <p>(Companion to Math Unit 7)</p>	<p><b>1. Clear and Effective Communication E.</b> Demonstrate effective, expressive, and receptive communication, including oral, written, multi-media, and performance.</p>	<p><b>4. Systems and Systems Models B.</b> Ask questions, make observations, and gather information to define a simple problem that can be solved through the development of a new or improved object or tool and analyze data from tests of the object/tool designed to solve the problem and identify its</p>	<p><b>1. Identity Development. D.</b> Value storytelling as a way to foster empathy and to understand the importance of mutual interdependence, relationality, and kinship</p>		<p><b>Topics:</b> Observing and gathering information, brainstorming solutions, designing and creating a model, testing and evaluating the design, analyzing data and making improvements, communicating findings</p>

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		strengths and weaknesses. K-2-ETS1-1; K-2-ETS1-3			



Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<p><b><u><a href="#">#2 How is sound made?</a></u></b></p> <p>(Companion to Math Unit 2)</p>	<p><b>3. Creative and Practical Problem Solving C.</b> Identify patterns, trends, and relationships that apply to solutions.</p>	<p><b>1. Structure and Function B.</b> Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. (1-PS4-1)</p>	<p><b>1. Identity Development D.</b> Value storytelling as a way to foster empathy and to understand the importance of mutual interdependence, relationality, and kinship.</p>		<p><b>Topics:</b> vibrating materials produce sound, sound can make materials vibrate, plan and conduct experiments, cause-and-effect relationships</p>
<p><b>#3 How can we improve our community space?</b></p> <p>(Companion to Math Unit 3)</p>	<p><b>3. Creative and Practical Problem Solving G.</b> Use a range of tools, including technology, to solve problems.</p>	<p><b>4. Systems and System Models B.</b> Ask questions, make observations, and gather information to define a simple problem that can be solved through the development of a new or improved object or tool and analyze data from tests of the object/tool designed</p>	<p><b>3. Interconnectedness B.</b> Challenge deficit-thinking about Ethnic Studies Groups.</p>		<p><b>Topics:</b> Ask questions, make observations, gather information, define a problem, engineering design cycle, develop solutions test and analyze, identify strengths and weaknesses</p>

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		to solve the problem and identify its strengths and weaknesses. K-2-ETS1-1; K-2-ETS1-3			
<p><b>#7 Are all plants the same?</b></p> <p>(Companion to Math Unit 7)</p>	<p><b>5. Informed and Integrative Thinking C.</b> Apply systems thinking to understand the interaction and influence of related parts on each other and on outcomes.</p>	<p><b>2. Cause and Effect B.</b> Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. (1-LS3-1)</p>	<p><b>3. Interconnectedness A.</b> Describe the ways that students, families, and communities of color come from generations of peoples who have rich intellectual and cultural traditions.</p>		<p><b>Topics:</b> Observing similarities and differences, evidence-based conclusions, variation in traits, examples of inheritance growth and development</p>
<p><b>#8 How can shapes work to solve problems?</b></p> <p>(Companion to Math Unit 8)</p>	<p><b>5. Informed and Integrative Thinking C.</b> Apply systems thinking to understand the interaction and influence of related parts on each other and on outcomes.</p>	<p><b>1. Structure and Function D.</b> Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>	<p><b>3. Interconnectedness D.</b> Contribute to community actualization and an equitable distribution of power.</p>		<p><b>Topics:</b> Understanding function and shape, sketching and modeling, connections and systems, engineering design cycle</p>

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		(K-2-ETS-2)			



Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<p><b>#2 How can we build something better for our community?</b></p> <p>(Companion to Math Unit 2)</p>	<p><b>2. Self-Direction G.</b> Collaborate as needed to advance learning.</p>	<p><b>1. Structure and Function A. Matter and Its Interactions: Structure of Matter</b> Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. 2-PS1-1</p>	<p><b>2. Resisting Racism D.</b> Develop new humanizing systems that value Ethnic Studies Groups.</p>		<p><b>Topics:</b> Plan an investigation, conduct an investigation, classify materials, describe observable properties, communicate findings</p>
<p><b>#3 What plants grow best where we live?</b></p> <p>(Companion to Math Unit 3)</p>	<p><b>3. Creative and Practical Problem Solving B.</b> Frame questions, make predictions, and design data collection and analysis strategies.</p>	<p><b>3. Energy and Matter C. Ecosystems: Interactions, Energy, and Dynamics</b> Plan and conduct an investigation to determine if plants need sunlight and water to grow. 2-LS2</p>	<p><b>3. Interconnectedness A.</b> Describe the ways that students, families, and communities of color come from generations of peoples who have rich intellectual and cultural traditions.</p>		<p><b>Topics:</b> Plan an investigation, conduct an investigation, measurement, make predictions, analyze findings, draw conclusions, communicate findings</p>

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<p><b>#6 How can small pieces come together to form something new?</b></p> <p>(Companion to Math Unit 6)</p>	<p><b>3. Creative and Practical Problem Solving D.</b> Analyze, evaluate, and synthesize evidence, arguments, claims, and beliefs.</p>	<p><b>3. Energy and Matter A. Matter and Its Interactions</b> Make observations to construct an evidence-based account of how an object made of a small set of pieces can be made into a new object. 2-PS1-3</p>	<p><b>1. Identity Development B.</b> Explore the historical, contemporary, interdependent, and multidimensional nature of identity (i.e. race, gender, disability, sexual identity, etc.).</p>		<p><b>Topics:</b> Observations combine and divide shapes, innovate using engineering design process</p>
<p><b>#8 How does diversity help create strong ecosystems and communities?</b></p> <p>(Companion to Math Unit 8)</p>	<p><b>5. Informed and Integrative Thinking A.</b> Apply knowledge from various disciplines and contexts to real life situations.</p>	<p><b>2. Cause and Effect A. Biological Evolution: Unity and Diversity</b> Make observations of plants and animals to compare the diversity of life in different habitats. 2-LS4-1</p>	<p><b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups</p>		<p><b>Topics:</b> Make observations, habitats and ecosystems, adaptations, diversity of life Interdependence, conservation factors</p>



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<p><b>#1 How do patterns help us identify why some species thrive?</b></p> <p>(Companion to Math Unit 1)</p>	<p><b>3. Creative and Practical Problem Solving C.</b> Identify patterns, trends, and relationships that apply to solutions.</p>	<p><b>2. Cause and Effect D. Biological Evolution: Unity and Diversity</b> Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.</p> <p>3-LS4-2</p>	<p><b>1. Identity Development B.</b> Explore the historical, contemporary, interdependent, and multidimensional nature of identity (i.e. race, gender, disability, sexual identity, etc.).</p>		<p><b>Topics:</b> Genetic variation, natural selection and adaptation, survival advantages in different environments, mating and reproduction, evidence from fossils and evolution, predator and prey</p>
<p><b>#2 How can I support my community?</b></p> <p>(Companion to Math Unit 2)</p>	<p><b>3. Creative and Practical Problem Solving A.</b> Observe and evaluate situations in order to define problems.</p>	<p><b>4. Systems and System Models B. Engineering Design</b> Define a simple problem that reflects a need or a want and includes specified criteria for</p>	<p><b>4. Social Responsibility D.</b> Co-create cultural community spaces that center healing (from the effects of historic and contemporary</p>		<p><b>Topics:</b> Materials and resources, engineering design cycle, problem solving, cost benefit analysis, define the problem, constraints of a problem,</p>

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		<p>success and constraints on materials, time, or cost. 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.</p> <p>3-5-ETS1-1; 3-5-ETS1-2</p>	<p>trauma, harm, and toxicity rooted in racism an intersectional forms of oppression) and wellness for dancing, singing, eating, and enjoying nature—as an art of understanding each other’s humanity and our relationship to our earth.</p>		<p>prototyping and testing</p>
<p><b>#6 Have people and animals always been friends?</b></p> <p>(Companion to Math Unit 6)</p>	<p><b>5. Informed and Integrative Thinking D.</b> Use evidence and reasoning to justify claims.</p>	<p><b>2. Cause and Effect D. Biological Evolution—Unity and Diversity: Response to Changes in Environment</b></p> <p>Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and</p>	<p><b>2. Resisting Racism C.</b></p> <p>Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.</p>		<p><b>Topics:</b> Adaptations for survival, arguing from evidence, environmental changes and impacts, variation in populations, data collection and analysis</p>

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		some cannot survive at all and make a claim supported by evidence that when the environment changes the types of plants and animals that live there may change. 3-LS4-3; 3-LS4-4			
<p><b>#8 Does sunshine make us happier?</b></p> <p>(Companion to Math Unit 8)</p>	<p><b>5. Informed and Integrative Thinking B.</b></p> <p>Analyze, evaluate, and synthesize information from multiple sources to build on knowledge.</p>	<p><b>3. Energy and Matter D.</b> Earth's Systems Organize and represent data to describe typical weather conditions expected during a particular season; obtain and combine information to describe climates in different regions of the world. 3-ESS2-1; 3-ESS2-2</p>	<p><b>1. Identity development C.</b></p> <p>Share their lived experiences, their gifts, dreams, stories and languages, indigeneity, immigration journeys and/or ancestral lineages while honoring the lived experiences of all.</p>		<p><b>Topics:</b> Weather patterns and seasons, data collection and representation, climates around the world, seasons, using technology, climate vs. weather, impact of weather and climate on people</p>



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<p><b>#2 Are waves only in the oceans?</b></p> <p>(Companion to Math Unit 2 )</p>	<p><b>5. Informed and Integrative Thinking E.</b> Develop and use models to explain phenomena.</p>	<p><b>1. Structure and Function B. Waves and Their Applications: Structure of Waves and Their Applications in Technology:</b> Develop a model of waves to describe how the structure of the waves can cause objects to move or enable them to be observed through the senses. 4-PS4-1; 4-PS2-2</p>	<p><b>2. Resisting Racism B.</b> Disrupt negative stereotypes and assumptions of Ethnic Studies Groups.</p>		<p><b>Topics:</b> Properties of waves, sound waves and hearing, light waves and vision, Wave energy and motion, wave technology modeling</p>
<p><b>#4 How can I be a responsible steward of the land?</b></p> <p>(Companion to Math Unit 4)</p>	<p><b>5. Informed and Integrative Thinking F.</b> Use technology to support and enhance the critical thinking process.</p>	<p><b>4. Systems and System Models C. Earth Systems</b> Obtain and combine information to describe that energy and fuels are derived from natural</p>	<p><b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.</p>		<p><b>Topics:</b> Natural resources and energy sources, how is energy used, environmental impacts and energy use, sustainable energy, decision</p>

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		resources and that their uses affect the environment. 4-ESS3-1			making, obtain and combine information from multiple sources
<p><b>#6 What keeps us alive?</b></p> <p>(Companion to Math Unit 6)</p>	<p><b>1. Clear and Effective Communication B.</b></p> <p>Use evidence and logic appropriately in communication.</p>	<p><b>1. Structure and Function C. From Molecules to Organisms: Structure and Function of Organisms:</b></p> <p>Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. 4-LS1-1</p>	<p><b>4. Social Responsibility B.</b></p> <p>Acknowledge that we have a social responsibility to address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all communities.</p>		<p><b>Topics:</b> Internal and external structure of plants, internal and external structure of animals, how structures support survival, growth and reproduction, adaptations and survival, construct and argument</p>
<p><b><u><a href="#">#7 Why does metal get so hot?</a></u></b></p> <p>(Companion to Math Unit 7)</p>	<p><b>2. Self-Direction C.</b></p> <p>Apply knowledge in familiar and new contexts.</p>	<p><b>3. Energy and Matter B. Energy:</b></p> <p>Use evidence to construct an explanation of the relationship between</p>	<p><b>2. Resisting Racism D.</b> Develop new humanizing systems that value Ethnic Studies Groups.</p>		<p><b>Topics:</b> Kinetic and potential energy, relationship between speed and effects, forms of energy, energy transfer</p>

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		<p>the speed of an object to the energy of that object and that energy can be transferred from place to place by sound, light, heat, and electrical currents. 4-PS3-1; 4-PS3-2</p>			



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<p><b>#4 How can I be a responsible steward of the land?</b></p> <p>(Companion to Math Unit 4)</p>	<p><b>2. Self-Direction B.</b> Integrate knowledge from a variety of sources to set goals and make informed decisions.</p>	<p><b>4. Systems and System Models A. Earth and Human Activity: Impact on Earth's Systems</b> Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. 5-ESS3-1</p>	<p><b>2. Resisting Racism A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy, patriarchy, heteronormativity, ableism, classism, institutional and structural racism, colonialism and imperialism, etc.)</p>		<p><b>Topics:</b> Obtain and combine information, Natural resources and sustainability, Human impact on the environment, Environmental protection</p>
<p><b>#5 What is the smallest thing in the world?</b></p> <p>(Companion to Math Unit 5)</p>	<p><b>5. Informed and Integrative Thinking E.</b> Develop and use models to explain phenomena.</p>	<p><b>1. Structure and Function A. Matter and Its Interactions: Structure of Matter</b> Develop a model to describe that despite matter being made of particles too small to be seen, it is always conserved when it</p>	<p><b>1. Identity Development D.</b> Value storytelling as a way to foster empathy and to understand the importance of mutual interdependence, relationality, and kinship.</p>		<p><b>Topics:</b> Properties of matter, Models, Particles and matter, Changes in matter, Law of conservation of matter</p>

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		undergoes changes. 5-PS1-1			
<p><b>#7 How do mathematical models, like numerical expressions, help us describe and predict the effects of changes in one Earth system on the others?</b></p> <p>(Companion to Math Unit 7)</p>	<p><b>5. Informed and Integrative Thinking E.</b> Develop and use models to explain phenomena.</p>	<p><b>2. Cause and Effect B. Earth's Systems: Interconnectedness of Earth's Spheres</b> Develop a model using an example to describe ways in which the geosphere, biosphere, hydrosphere, and/or atmosphere interact. 5-ESS2-1</p>	<p><b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont</p>		<p><b>Topics:</b> Modeling systems and interactions; geosphere, biosphere, hydrosphere, atmosphere; Interactions between spheres: volcanic eruptions, hurricanes, deforestation, water cycles</p>
<p><b>#8 <a href="#">Are water, ice, and clouds the same thing?</a></b></p> <p>(Companion to Math Unit 8)</p>	<p><b>1. Clear and Effective Communication F.</b> Use technology to further enhance and disseminate communication.</p>	<p><b>3. Energy and Matter A. Matter and Its Interactions: Law of Conservation of Matter</b> Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating,</p>	<p><b>4. Social Responsibility B.</b> Acknowledge that we have a social responsibility to address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all</p>		<p><b>Topics:</b> Law of conservation of matter, measuring and graphing mass before and after changes, physical vs. chemical Changes and mass conservation, plan and conduct</p>

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		cooling, or mixing substances, the total weight of matter is conserved. 5-PS1-2	communities.		experiments



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<p><a href="#">#1 How can we make sure everyone has clean water?</a></p>	<p><b>5. Informed and Integrative Thinking D.</b> Use evidence and reasoning to justify claims.</p>	<p><b>1. Structure and Function A.</b> Matter and Its Interactions: Structure of Matter Develop a model to describe that matter is composed of atoms and molecules. Analyze and interpret data on the properties of substances before and after chemical changes have occurred . MS-PS1-2; MS-PS1-1</p>	<p><b>2. Resisting Racism A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy, patriarchy, heteronormativity, ableism, classism, institutional and structural racism, colonialism and imperialism, etc.).</p>		<p><b>Topics:</b> Atoms and molecules as the building blocks of matter, physical vs. chemical changes, properties of substances before and after reactions, real-world chemical reactions (e.g., rusting, baking, combustion,) environmental justice &amp; chemical exposure</p>
<p><b>#2 How do waves help us communicate?</b></p>	<p><b>1. Clear and Effective Communication D.</b> Adjust communication based on the audience, context, and purpose.</p>	<p><b>1. Structure and Function B. Waves and Their Applications in Technologies for Information Transfer</b> Describe how the amplitude of</p>	<p><b>3. Interconnectedness C.</b> Build one's purpose anchored in an anti-racist, anti-discriminatory, and intercultural solidarity.</p>		<p><b>Topics:</b> Amplitude, wavelength, and frequency; sound waves vs. light waves reflection, absorption, and transmission of</p>

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		a wave is related to the energy in a wave and develop a model to demonstrate how waves are reflected, absorbed, or transmitted through various materials. MS-PS4-1; MS-PS4-2			waves
<b>#3 How do our cells work together to keep us healthy?</b>	<b>4. Responsible and Involved Citizen E.</b> Demonstrate a commitment to personal and community health and wellness.	<b>1. Structure and Function C. From Molecules to Organisms: Structures and Processes</b> Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. Develop and use a model to describe the function of a cell as a whole and ways parts of cells	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.		<b>Topics:</b> Structure and function of cells (plant vs. animal); the role of organelles in cell function; unicellular vs. multicellular organisms; microscopes and their impact on biology

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		contribute to the function. MS-LS1-1; MS-LS1-2			
<b>#4 How do fossils, rocks, and space exploration help us uncover Earth's history?</b>	<b>5. Informed and Integrative Thinking E.</b> Develop and use models to explain phenomena.	<b>2. Cause and Effect A.</b> Earth's Place in the Universe Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions and how these changes are reflected in the geologic time scale. MS-ESS2-3; MS-ESS1-4	<b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups.		<b>Topics:</b> Fossils as evidence of Earth's history, plate motion and continental drift, geologic time scale and Earth's major events, The role of space exploration in understanding, Earth's past, diverse contributions to space science
<b>#5 How do earth's surfaces keep changing?</b>	<b>2. Self- Direction D.</b> Demonstrate initiative and responsibility for learning.	<b>2. Cause and Effect B. Earth's Systems</b> Construct an explanation based on evidence for how geoscience processes have	<b>4. Social Responsibility C.</b> Engage in difficult yet humanizing conversations about racism and its intersections with		<b>Topics:</b> Weathering, erosion, and deposition; plate tectonics and their role in earthquakes and volcanoes; the rock cycle and soil

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		changed Earth’s surface/spheres at varying time and spatial scales. MS-ESS2-2	language, class, gender, and disability, etc.		formation
<b>#6 How can we keep ecosystems healthy?</b>	<b>5. Informed and Integrative Thinking D.</b> Analyze, evaluate, and synthesize information from multiple sources to build on knowledge	<b>3. Energy and Matter C. Ecosystems: Interactions, Energy, and Dynamics</b> Develop a model to describe the cycling of matter and flow of energy among living and non-living parts of an ecosystem. MS-LS2-3	<b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups.		<b>Topics:</b> Energy transfer in food chains and food webs; role of producers, consumers, and decomposers; nutrient cycles
<b>#7 How can we solve real-world problems?</b>	<b>3. Creative and Practical Problem Solving H.</b> Persist in solving challenging problems and learn from failure.	<b>4. Systems and System Models B. Engineering</b> Design Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into	<b>3. Interconnectedness C.</b> Build one’s purpose anchored in an anti-racist, anti-discriminatory, and intercultural solidarity		<b>Topics:</b> The engineering design process; defining a problem and setting criteria/constraints; testing, revising, and optimizing solutions; Ethical considerations in

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		account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-1			engineering and technology; inclusive design and accessibility
<b>#8 What is climate?</b>	<b>5. Informed and Integrative Thinking B.</b> Analyze, evaluate, and synthesize information from multiple sources to build on knowledge.	<b>2. Cause and Effect D. Energy and Matter</b> Earth's Systems Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. MS-ESS2-6.	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.		<b>Topics:</b> Weather patterns, ocean currents, climate zones.



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<p><b>#1 How do chemical reactions shape our world?</b></p>	<p><b>5. Informed and Integrative Thinking D.</b> Use evidence and reasoning to justify claims.</p>	<p><b>3. Energy and Matter A. Matter and Its Interactions</b> Develop a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved, and provide evidence that the chemical reaction results in either the release or absorption of thermal energy. MS-PS1-5; MS-PS1-6</p>	<p><b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.</p>		<p><b>Topics:</b> Conservation of matter in chemical reactions, thermal energy changes during chemical reactions, real-world examples of chemical reactions</p>
<p><b>#2 How does energy impact our daily lives?</b></p>	<p><b>1. Clear and Effective Communication A.</b> Demonstrate organized and purposeful</p>	<p><b>3. Energy and Matter B. Energy</b> Investigate and explain the relationships among energy transferred,</p>	<p><b>2. Resisting Racism A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy,</p>		<p><b>Topics:</b> Energy transfer between objects, temperature and particle movement, heat capacity and</p>

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
	communication.	the type of matter, the mass, and the change in the average kinetic energy of the particles. MS-PS3-4	patriarchy, heteronormativity, ableism, classism, institutional and structural racism, colonialism and imperialism, etc.).		insulation, kinetic and potential energy, energy conservation and efficiency, forms of energy
<b>#3 How do waves help us communicate, stay healthy, and understand the world?</b>	<b>2. Self-Direction C.</b> Apply knowledge in familiar and new contexts.	<b>1. Structure and Function B. Waves and Their Applications in Technologies for Information Transfer</b> Describe how the amplitude of a wave is related to the energy in a wave and develop a model to demonstrate how waves are reflected, absorbed, or transmitted through various materials. MS-PS4-1; MS-PS4-2	<b>3. Interconnectedness B.</b> Challenge deficit-thinking about Ethnic Studies Groups.		<b>Topics:</b> Types of waves (sound, light, electromagnetic waves); wave properties (amplitude, wavelength, frequency); technological applications of waves (e.g., Wi-Fi, cell phones, medical imaging); wave equations; complex wave behaviors
<b>#4 How do changes in</b>	<b>1. Clear and Effective</b>	<b>2 Cause and Effect C. Ecosystems:</b>	<b>3. Interconnectedness</b>		<b>Topics:</b> Producers,

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<b>ecosystems affect living things?</b>	<b>Communication E.</b> Demonstrate effective, expressive, and receptive communication, including oral, written, multi-media, and performance.	<b>Interactions, Energy, and Dynamics</b> Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-LS2-4	<b>s A.</b> Describe the ways that students, families, and communities of color come from generations of peoples who have rich intellectual and cultural traditions.		consumers, and decomposers; population dynamics and carrying capacity; effects of physical and biological changes on populations; human impact on ecosystems
<b>#5 Does climate change impact people equally?</b>	<b>3. Creative and Practical Problem Solving A.</b> Observe and evaluate situations in order to define problems.	<b>3. Energy and Matter D. Earth's Systems</b> Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. MS-ESS2-6	<b>2. Resisting Racism A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy, patriarchy, heteronormativity, ableism, classism, institutional and structural racism, colonialism and imperialism, etc.)		<b>Topics:</b> Atmospheric and oceanic circulation patterns; global climate systems and their effects on weather; factors influencing weather and climate (e.g., greenhouse gases, ocean currents); climate zones and climate change

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<b>#6 How do genetic variations and adaptations in organisms, including humans, help explain survival and diversity?</b>	<b>5. Informed and Integrative Thinking E.</b> Develop and use models to explain phenomena.	<b>2. Cause and Effect D. Biological Evolution: Unity and Diversity</b> Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment and identify technologies humans use to influence the inheritance of desired traits in organisms. MS-LS4-4; MS-LS4-5	<b>2. Resisting Racism B.</b> Disrupt negative stereotypes and assumptions of Ethnic Studies Groups.		<b>Topics:</b> Natural selection and survival of the fittest; Genetic variation and inheritance; Evidence for evolution (fossils, comparative anatomy, molecular evidence); Evolutionary adaptations of species to their environments

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<b>#7 How do we balance population growth and resource consumption?</b>	<b>5. Informed and Integrative E.</b> Develop and use models to explain phenomena	<b>4. Systems and systems models A. Earth and Human Activity</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	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont		<b>Topics:</b> Population growth and resource consumption; sustainable resource management and conservation; environmental policy and human responsibility
<b>#8 How can we use engineering to solve real-world problems?</b>	<b>3. Creative and Practical Problem Solving H.</b> Persist in solving challenging problems and learn from failure.	<b>4. Systems and systems models B. Engineering Design</b> 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	<b>3. Interconnectedness C.</b> Build one's purpose anchored in an anti-racist, anti-discriminatory, and intercultural solidarity		<b>Topics:</b> Defining engineering problems and identifying sustainable solutions; the engineering design process; environmental impact assessments and sustainability considerations;

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		impacts on people and the natural environment that may limit possible solutions. MS-ETS1-1			examples of sustainable engineering solutions



Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<b>#1 Where do chemical reactions happen in real life?</b>	<b>5. Informed and Integrative Thinking D.</b> Use evidence and reasoning to justify claims.	<b>3. Energy and Matter A.</b> Matter and Its Interactions Develop a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved, and provide evidence that the chemical reaction results in either the release or absorption of thermal energy. MS-PS1-5; MS-PS1-6	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont		<b>Topics:</b> Conservation of mass, reaction types, energy in reactions
<b>#2 How does energy move through the world around us?</b>	<b>3. Creative and Practical Problem Solving C.</b> Identify patterns, trends, and relationships that apply to solutions. Students will analyze data on kinetic and	<b>3. Energy and Matter B.</b> Energy Investigate and explain the relationships among energy transferred, the type of matter, the mass, and the	<b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups.		<b>Topics:</b> Kinetic & potential energy, heat transfer in motion, work and force

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
	potential energy to identify trends and explain real-world transportation efficiency.	change in the average kinetic energy of the particles. MS-PS3-4			
<b>#3 How do waves carry information, and how do different materials affect the way waves travel?</b>	<b>4. Responsible and Involved Citizenship F.</b> Practice responsible digital citizenship.	<b>1. Structure and Function B. Waves and Their Applications in Technologies for Information Transfer</b> Describe how the amplitude of a wave is related to the energy in a wave and develop a model to demonstrate how waves are reflected, absorbed, or transmitted through various materials. MS-PS4-1; MS-PS4-2	<b>2. Resisting Racism A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy, patriarchy, heteronormativity, ableism, classism, institutional and structural racism, colonialism and imperialism, etc.).		<b>Topics:</b> Light and sound waves, Wi-Fi and communication technologies
<b>#4 How can we reduce the harmful effects of climate change on our</b>	<b>5. Informed and Integrative Thinking B.</b> Analyze, evaluate,	<b>4. Systems and systems models C. Earth and Human Activity</b> Ask	<b>3. Interconnectedness C.</b> Build one's purpose anchored in		<b>Topics:</b> Greenhouse gases, carbon cycle, fossil fuel effects

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
planet?	and synthesize information from multiple sources to build on knowledge.	questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. MS-ESS3-5	an anti-racist, anti-discriminatory, and intercultural solidarity		
<b>#5 How do the Earth's oceans and atmosphere work together to create weather patterns and climate?</b>	<b>4. Responsible and Involved Citizenship D.</b> Respect diversity and differing points of view.	<b>3. Energy and Matter D.</b> Earth's Systems Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. MS-ESS2-6	<b>4. Social Responsibility B.</b> Acknowledge that we have a social responsibility to address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all communities.		<b>Topics:</b> Ocean currents, wind patterns, weather systems
<b><u><a href="#">#6 How do genetic changes in organisms affect their survival, and how do humans influence these changes?*</a></u></b>	<b>2. Self-Direction C.</b> Apply knowledge in familiar and new contexts.	<b>2. Cause and Effect D. Biological Evolution: Unity and Diversity</b> Construct an explanation based on evidence that	<b>1. Identity Development- A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups		<b>Topics:</b> Natural selection, human-influenced genetic changes

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment and identify technologies humans use to influence the inheritance of desired traits in organisms. MS-LS4-4; MS-LS4-5			
<p><b>#7 How do human activities impact the Earth's resources, and what can we do to make sure those resources are used fairly and sustainably?</b></p>	<p><b>3. Creative and Practical Problem Solving G.</b> Identify opportunities for innovation and collaboration.</p>	<p><b>4. Systems and Systems Models A. Earth and Human Activity</b> Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources</p>	<p><b>2. Resisting Racism A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy, patriarchy, heteronormativity, ableism, classism, institutional and structural racism, colonialism and</p>		<p><b>Topics:</b> Renewable vs. nonrenewable resources, conservation efforts</p>

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		impact Earth's systems. MS-ESS3-4	imperialism, etc.)		
<b>#8 How can we design solutions to problems that will help create a more sustainable and just world?</b>	<b>1. Clear and Effective Communication E.</b> Demonstrate effective, expressive, and receptive communication, including oral, written, and multimedia performance.	<b>4. Systems and systems models B. Engineering Design</b> 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. MS-ETS1-1	<b>3. Interconnectedness C.</b> Build one's purpose anchored in an anti-racist, anti-discriminatory, and intercultural solidarity.		<b>Topics:</b> Design thinking, problem-solving for sustainability



Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<b>#1 How can the story of Earth formation connect to narratives that help us understand our relationship with the planet and each other?</b>	<b>1. Clear and Effective Communication E.</b> Demonstrate effective, expressive, and receptive communication, including oral, written, multi-media, and performance.	<b>2. Cause and Effect A. Earth's Systems: Connections Between Physical Earth and Evolution</b> Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. (HS-ESS2-7)	<b>1. Identity Development D.</b> Value storytelling as a way to foster empathy and to understand the importance of mutual interdependence, relationality, and kinship.		<b>Topics:</b> Introduction to Earth's spheres (geosphere, hydrosphere, atmosphere, biosphere); plate tectonics, rock cycle, and the water cycle; earth's feedback loops and system interactions
<b>#2 How can the contributions and perspectives of diverse communities enhance our understanding of Earth's systems and evolution?</b>	<b>1. Clear and Effective Communication A.</b> Demonstrate organized and purposeful communication.	<b>2. Cause and Effect A. Earth's Systems: Connections Between Physical Earth and Evolution</b> Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. (HS-ESS2-7)	<b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups.		<b>Topics:</b> Early Earth's atmosphere and the role of life in shaping it, evolution of life and mass extinctions, the fossil record and geologic time scale, how changes in Earth's systems (e.g., asteroid impacts, ice ages) influenced evolution

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<b>#3 How do changes in Earth's systems create feedback loops?</b>	<b>5. Informed and Integrative Thinking D.</b> Use evidence and reasoning to justify claims.	<b>2 Cause and Effect B. Earth's Systems: Interconnectedness of Earth's Spheres</b> Make an evidence-based claim that one change to Earth's surface or atmosphere can create feedbacks that cause changes to other Earth's systems. (HS-ESS2-2; HS-ESS3-5)	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.		<b>Topics:</b> How one change in Earth's system can cause cascading effects; Examples of feedback loops: Ice-albedo effect, ocean-atmosphere interactions; Natural disasters and their long-term effects on ecosystems
<b>#4 How do changes in Earth's energy balance affect climate?</b>	<b>5. Informed and Integrative Thinking B.</b> Analyze, evaluate, and synthesize information from multiple sources to build on knowledge	<b>3. Energy and Matter D. Earth's Systems: Energy and Climate Change</b> Demonstrate understanding of how variations in the flow of energy into and out of Earth's systems result in changes in climate. (HS-ESS2-4)	<b>3. Interconnectedness A.</b> Describe the ways that students, families, and communities of color come from generations of peoples who have rich intellectual and cultural traditions.		<b>Topics:</b> Earth's energy budget and the greenhouse effect; Natural drivers of climate (Milankovitch cycles, solar radiation, ocean currents); Carbon cycle and natural climate variability

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<b>#5 How do I impact Earth's systems?</b>	<b>5. Informed and Integrative Thinking C.</b> Apply systems thinking to understand the interaction and influence of related parts on each other, and on outcomes.	<b>4. Systems and Systems Models A. Earth and Human Activity: Impact on Earth's Systems</b> Use a representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. (HS-ESS3-6)	<b>1 Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups		<b>Topics:</b> Agriculture, deforestation, urbanization, pollution; Ocean acidification and biodiversity loss; Disruptions to natural cycles (carbon, nitrogen, water)
<b>#6 How can science make the world better for each person?</b>	<b>3. Creative and Practical Problem Solving C.</b> Identify patterns, trends, and relationships that apply to solutions	<b>4. Systems and Systems Models C. Earth and Human Activity Climate Change</b> Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and	<b>4 Social Responsibility B.</b> Acknowledge that we have a social responsibility to address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all communities.		<b>Topics:</b> Evidence of modern climate change (ice cores, temperature records, sea level rise); Extreme weather, natural disasters, and global climate patterns; Climate change projections using global models

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		associated future impacts to Earth systems. (HS-ESS3-5)			
<b>#7 Can we solve climate change?</b>	<b>3. Creative and Practical Problem Solving G.</b> Use a range of tools, including technology, to solve problems.	<b>4. Systems and systems models C. Earth and Human Activity: Climate Change</b> Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. (HS-ESS3-5)	<b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups		<b>Topics:</b> Renewable energy and carbon sequestration; Climate adaptation strategies (sea walls, urban planning, reforestation); The role of policy, activism, and international agreements (e.g., Paris Agreement)
<b>#8 How can we design renewable energy solutions that address environmental</b>	<b>3. Creative and Practical Problem Solving H.</b> Persist in solving challenging problems and learn	<b>4. Systems and systems models B. Engineering Design: Devising Solutions To</b>	<b>4 Social Responsibility B.</b> Acknowledge that we have a social responsibility to		<b>Topics:</b> Engineering Design Topics: Introduction to Engineering Design Process

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<u>challenges for all?</u>	from failure.	<b>Complex Real-World Problems</b> Model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints, and how those solutions affect interactions within and between systems. (HS-ETS1-4)	address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all communities.		Complex Problem Solving in Engineering Systems Thinking in Engineering Evaluating Trade-Offs and Constraints Modeling and Prototyping Solutions



Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<p><b>#1 How do the structures and functions of cells help us understand identity?</b></p>	<p><b>1. Clear and Effective Communication A.</b> Demonstrate organized and purposeful communication</p>	<p><b>1. Structure and Function C. From Molecules to Organisms: Structure and Function of Organisms</b> Explain how an organism's structure relates to its function and how components form interacting systems with specific roles in multicellular organisms. (HS-LS1-1; HS-LS1-2)</p>	<p><b>1. Identity Development B.</b> Explore the historical, contemporary, interdependent, and multidimensional nature of identity (i.e. race, gender, disability, sexual identity, etc.)</p>		<p><b>Topics:</b> Cell structures &amp; functions; cell membranes &amp; boundaries in identity; organelles &amp; identity roles; DNA &amp; the complexity of identity; cell specialization &amp; intersectional identity; cellular cooperation &amp; community identity mutations, adaptations, &amp; identity growth</p>
<p><b>#2 How do the interactions between tissues, organs, and body systems influence health?</b></p>	<p><b>5. Informed and Integrative Thinking C.</b> Apply systems thinking to understand the interaction and influence of related parts on each other,</p>	<p><b>1. Structure and Function C. From Molecules to Organisms: Structure and Function of Organisms</b> Explain how an organism's</p>	<p><b>2. Resisting Racism A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy, patriarchy, heteronormativity,</p>		<p><b>Topics:</b> Tissues, organs, and organ systems; interdependence of body systems; medical &amp; scientific bias; ethics in biotechnology &amp;</p>

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
	and on outcomes.	structure relates to its function and how components form interacting systems with specific roles in multicellular organisms. (HS-LS1-1; HS-LS1-2)	ableism, classism, institutional and structural racism, colonialism and imperialism, etc.)		medicine
<a href="#"><u>#3 Should ethical considerations guide our use of genetic engineering?</u></a>	<b>4. Responsible and Involved Citizenship C.</b> Demonstrate ethical behavior and the moral courage to sustain it.	<b>2. Cause and Effect D. Biological Evolution: Unity and Diversity– Response to Environmental Conditions</b> Construct an explanation based on evidence for how natural selection leads to adaptation of populations and evaluate the claims that changes in the environmental conditions may result in changes in the populations of	<b>1. Identity Development B.</b> Explore the historical, contemporary, interdependent, and multidimensional nature of identity (i.e. race, gender, disability, sexual identity, etc.)		<b>Topics:</b> Genetic variation & mutation; genetic research and identity; genetic technology- CRISPR/gene editing; disability and genetics; genetic ancestry, testing and Identity

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		species. (HS-LS4-4; HS-LS4-5)			
<b>#4 How does evolution shape human and cultural diversity?</b>	<b>1. Clear and Effective Communication D.</b> Adjust communication based on the audience, context, and purpose.	<b>2. Cause and Effect D. Biological Evolution: Unity and Diversity— Response to Environmental Conditions</b> Construct an explanation based on evidence for how natural selection leads to adaptation of populations and evaluate the claims that changes in the environmental conditions may result in changes in the populations of species. (HS-LS4-4; HS-LS4-5)	<b>1. Identity Development D.</b> Value storytelling as a way to foster empathy and to understand the importance of mutual interdependence, relationality, and kinship.		<b>Topics:</b> Natural Selection & Adaptation; Speciation & Evolutionary Trees; Human Evolution & Migration- the creation of Race Colonialism & Its Impact on Evolutionary Processes; Biodiversity & Cultural Perspectives on Species Conservation
<b>#5 How do our actions impact ecosystems, and how can we create</b>	<b>5. Informed and Integrative Thinking B.</b> Analyze, evaluate,	<b>3. Energy and Matter C. Ecosystems: Interactions,</b>	<b>4. Social Responsibility B.</b> Acknowledge that we have a social		<b>Topics:</b> The Flow of Energy in Ecosystems; The Cycling of

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<p><b>fair solutions for people and the planet?</b></p>	<p>and synthesize information from multiple sources to build on knowledge.</p>	<p><b>Energy, and Dynamics – Cycling of Matter and Energy in Environment</b> Support claims for the cycling of matter and flow of energy among organisms and/or environments in an ecosystem, a biome, or spheres of the Earth. (HS-LS2-4; HS-LS2-5)</p>	<p>responsibility to address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all communities.</p>		<p>Matter Food Security, Sustainability, and Matter Cycling; Deforestation and Urbanization</p>
<p><b>#6 How is climate change transforming ecosystems, who is impacted and how do we respond?</b></p>	<p><b>1. Clear and Effective Communication A.</b> Demonstrate organized and purposeful communication.</p>	<p><b>2 Cause and Effect C. Ecosystems: Interactions, Energy, and Dynamics-Response to Changes in Environment</b> Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems</p>	<p><b>2 Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont</p>		<p><b>Topics:</b> Climate Change and Ecosystem Responses; Local and Global Effects of Climate Change; Climate Change and Environmental Justice; Sustainable Solutions &amp; Climate Action</p>

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. (HS-LS2-6; HS-LS2-7)			
<b>#7 Can I have an impact on a current issue facing my community?</b>	<b>3. Creative and Practical Problem Solving C.</b> Identify patterns, trends, and relationships that apply to solutions.	<b>4. Systems and Systems Models B. Engineering Design: Devising Solutions To Complex Real-World Problems</b> Model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints, and how those solutions affect interactions within and between systems.	<b>3. Interconnectedness C.</b> Build one's purpose anchored in an anti-racist, anti-discriminatory, and intercultural solidarity.		<b>Topics:</b> Introduction to engineering design process; complex problem solving in engineering; systems thinking in engineering; evaluating trade-offs and constraints modeling and prototyping solutions

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		(HS-ETS1-4)			
<b>#8 How can I help others with what I have learned?</b>	<b>2. Self-Direction C.</b> Apply knowledge in familiar and new contexts	<b>1. Structure and Function C. From Molecules to Organisms: Structure and Function of Organisms</b> Explain how an organism's structure relates to its function and how components form interacting systems with specific roles in multicellular organisms. (HS-LS1-1; HS-LS1-2)	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.		<b>Topics:</b> review previously taught content to integrate into final research project



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<b>#1 How does the structure of an atom determine its properties and interactions?</b>	<b>1. Clear and Effective Communication A.</b> Demonstrate organized and purposeful communication.	<b>1. Structure and Function A.</b> Matter and Its Interactions: Structure of Matter Construct and revise an explanation for the outcome of reactions based on the structure of atoms and molecules and knowledge of chemical properties (e.g., trends in periodic table). (HS-PS1-2)	<b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups.		<b>Topics:</b> Atomic structure, periodic trends, electron configurations
<b>#2 How do chemical reactions follow the law of conservation of mass?</b>	<b>5. Informed and Integrative Thinking D.</b> Use evidence and reasoning to justify claims.	<b>3. Energy and Matter A. Matter and Its Interactions: Law of Conservation of Matter</b> Investigate the claim that atoms, and therefore mass, are conserved during	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.		<b>Topics:</b> Conservation of mass, balancing equations, reaction classification

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
		a chemical reaction. Compare and contrast the changes in atoms involved in a nuclear reaction to those involved in a chemical reaction. (HS-PS1-7; HS-PS1-8)			
<b>#3 How does energy change?</b>	<b>5. Informed and Integrative Thinking B.</b> Analyze, evaluate, and synthesize information from multiple sources to build on knowledge.	<b>3. Energy and Matter B. Energy: First Law of Thermodynamics</b> Provide evidence through the process of investigation that the transfer of energy between components with different energy amounts in a system leads to a state of balance or equilibrium. (HS-PS3-4; HS-PS3-1)	<b>4. Social Responsibility B.</b> Acknowledge that we have a social responsibility to address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all communities.		<b>Topics:</b> Exothermic vs. endothermic reactions, entropy, equilibrium

Essential Question	Transferable Skill PPI	Content PPI	IRIS PPI	Summative Assessment	Unit content topics
<p><a href="#"><u>#4 What are the ethical responsibilities and societal consequences of using nuclear energy?</u></a></p>	<p><b>3. Creative and Practical Problem Solving D.</b> Analyze, evaluate, and synthesize evidence, arguments, claims, and beliefs.</p>	<p><b>3. Energy and Matter A. Matter and Its Interactions: Law of Conservation of Matter</b> Investigate the claim that atoms, and therefore mass, are conserved during a chemical reaction. Compare and contrast the changes in atoms involved in a nuclear reaction to those involved in a chemical reaction. (HS-PS1-7; HS-PS1-8)</p>	<p><b>4. Social Responsibility A.</b> Understand the impact of social movements and the solidarity efforts that fought for the freedom of all peoples, especially for Ethnic Studies Groups.</p>		<p><b>Topics:</b> Fission, fusion, radioactivity, nuclear reactions</p>
<p><b>#5 How can chemistry be used to address water quality issues?</b></p>	<p><b>2. Self-Direction F.</b> Analyze the accuracy, bias, and usefulness of information.</p>	<p><b>3. Energy and Matter B. Energy: First Law of Thermodynamics</b> Provide evidence through the process of investigation that the transfer of energy between components with</p>	<p><b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont</p>		<p><b>Topics:</b> pH, solubility, acid-base reactions, concentration</p>

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		different energy amounts in a system leads to a state of balance or equilibrium. (HS-PS3-4; HS-PS3-1)			
<b>#6 How do different types of chemical bonds determine material properties?</b>	<b>5. Informed and Integrative Thinking E.</b> Develop and use models to explain phenomena.	<b>1. Structure and Function A.</b> Matter and Its Interactions: Structure of Matter Construct and revise an explanation for the outcome of reactions based on the structure of atoms and molecules and knowledge of chemical properties (e.g., trends in periodic table). (HS-PS1-2)	<b>3. Interconnectedness B.</b> Challenge deficit-thinking about Ethnic Studies Groups		<b>Topics:</b> Covalent, ionic, metallic bonding, intermolecular forces
<b>#7 What makes things rust?</b>	<b>1. Clear and Effective Communication D.</b> Adjust	<b>3. Energy and Matter A. Matter and Its Interactions: Law</b>	<b>4. Social Responsibility A.</b> Understand the impact of social		<b>Topics:</b> Oxidation-reduction, electrochemical cells, corrosion

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	communication based on the audience, context, and purpose.	<b>of Conservation of Matter</b> Investigate the claim that atoms, and therefore mass, are conserved during a chemical reaction. Compare and contrast the changes in atoms involved in a nuclear reaction to those involved in a chemical reaction. (HS-PS1-7; HS-PS1-8)	movements and the solidarity efforts that fought for the freedom of all peoples, especially for Ethnic Studies Groups.		
<b>#8 How do chemical processes drive climate change?</b>	<b>4. Responsible and Involved Citizenship E.</b> Demonstrate a commitment to personal and community health and wellness.	<b>3. Energy and Matter D. Earth's Systems: Energy and Climate Change</b> Demonstrate understanding of how variations in the flow of energy into and out of Earth's systems result in changes in climate. (HS-ESS2-4)	<b>3. Interconnectedness C.</b> Build one's purpose anchored in an anti-racist, anti-discriminatory, and intercultural solidarity.		<b>Topics:</b> Greenhouse gases, fossil fuels, carbon cycle





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<b>#1 Why does energy change?</b>	<b>1. Clear and Effective Communication B.</b> Use evidence and logic appropriately in communication.	<b>3. Energy and Matter B. Energy: First Law of Thermodynamics</b> Provide evidence through the process of investigation that the transfer of energy between components with different energy amounts in a system leads to a state of balance or equilibrium. (HS-PS3-4; HS-PS3-1)	<b>3. Interconnectedness- A.</b> Describe the ways that students, families, and communities of color come from generations of peoples who have rich intellectual and cultural traditions.		<b>Topics:</b> Energy conservation, work, power, thermal equilibrium
<b>#2 How do the properties of waves impact their application in communication technologies and our daily lives?</b>	<b>3. Creative and Practical Problem Solving D.</b> Analyze, evaluate, and synthesize evidence, arguments, claims, and beliefs	<b>1. Structure and Function B. Waves and Their Applications: Structure of Waves and Their Applications in Technology</b>	<b>2. Resisting Racism- A.</b> Examine how systems work to uphold oppression and exclusion (i.e. white supremacy, patriarchy, heteronormativity,		<b>Topics:</b> Wave properties, sound, light, wave interactions with materials

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		Support a claim regarding the relationships among the frequency, wavelength, and speed of waves travelling in various media. Understand how wave behavior is applied in the development of technological devices used to transmit and capture information and energy. (HS-PS4-1; HS-PS4-5)	ableism, classism, institutional and structural racism, colonialism and imperialism, etc.).		
<a href="#">#3 How does gravity work?</a>	<b>5. Informed and Integrative Thinking A.</b> Apply knowledge from various disciplines and contexts to real life situations	<b>3. Energy and Matter B. Energy: First Law of Thermodynamics</b> Provide evidence through the process of investigation that the transfer of energy between components with different energy	<b>4. Social Responsibility B.</b> Acknowledge that we have a social responsibility to address the ways systemic racism, poverty, and intersectional oppressions have caused harm to all		<b>Topics:</b> Momentum, Newton’s Laws applications, interactions of matter

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		amounts in a system leads to a state of balance or equilibrium. (HS-PS3-4; HS-PS3-1)	communities.		
<b>#4 Why does the sun matter so much?</b>	<b>5. Informed and Integrative Thinking D.</b> Use evidence and reasoning to justify claims.	<b>3. Energy and Matter D. Earth's Systems: Energy and Climate Change</b> Demonstrate understanding of how variations in the flow of energy into and out of Earth's systems result in changes in climate. (HS-ESS2-4)	<b>4. Social responsibility C.</b> Engage in difficult yet humanizing conversations about racism and its intersections with language, class, gender, and disability, etc.		<b>Topics:</b> Solar energy, energy transfer, impact on Earth's systems
<b>#5 How does a radio work?</b>	<b>1. Clear and Effective Communication F.</b> Use technology to further enhance and disseminate communication	<b>1. Structure and Function B. Waves and Their Applications: Structure of Waves and Their Applications in Technology</b>	<b>3. Interconnectedness B.</b> Challenge deficit-thinking about Ethnic Studies Groups.		<b>Topics:</b> Electromagnetic spectrum, wireless communication, data transmission

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		Support a claim regarding the relationships among the frequency, wavelength, and speed of waves travelling in various media. Understand how wave behavior is applied in the development of technological devices used to transmit and capture information and energy. (HS-PS4-1; HS-PS4-5)			
<b>#6 Can the Earth's orbit change my day?</b>	<b>3. Creative and Practical Problem Solving G.</b> Use a range of tools, including technology, to solve problems	<b>2. Cause and Effect B. Earth's Systems: Interconnectedness of Earth's Spheres</b> Make an evidence-based claim that one change to Earth's surface or atmosphere can	<b>2. Resisting Racism C.</b> Research the ways that systems have impacted their lives, Ethnic Studies groups, and Vermont.		<b>Topics:</b> Feedback loops, atmosphere-biosphere interactions

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		create feedbacks that cause changes to other Earth's systems. (HS-ESS2-2; HS-ESS3-5)			
<b>#7 Can engineering design be used to create sustainable solutions to global challenges?</b>	<b>3. Creative and Practical Problem Solving H.</b> Persist in solving challenging problems and learn from failure.	<b>4. Systems and systems models B. Engineering Design: Devising Solutions To Complex Real-World Problems</b> Model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints, and how those solutions affect interactions within and between systems. (HS-ETS1-4)	<b>1. Identity Development A.</b> Identify the contributions, cultures, and histories of Ethnic Studies Groups.		<b>Topics:</b> Engineering problem-solving, sustainable technology
<b>#8 How do human</b>	<b>3. Creative and</b>	<b>4. Systems and</b>	<b>4 Social</b>		<b>Topics:</b> Human

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activities impact Earth's physical systems?	<b>Practical Problem Solving H.</b> Persist in solving challenging problems and learn from failure.	<b>systems models A. Earth and Human Activity: Impact on Earth's Systems</b> Use a representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. (HS-ESS3-6)	<b>Responsibility A.</b> Understand the impact of social movements and the solidarity efforts that fought for the freedom of all peoples, especially for Ethnic Studies Groups.		activities affecting natural systems, climate impact models