Thomaston Public Schools - Curriculum Overview and Pacing Guide

Directions - Each colored box below represents one curricular unit. In each box, complete as much of the required information as possible (unit title, unit pacing, unit overview, priority learning targets). On its own, this document will eventually become a public-facing and quick-reference curriculum guide. As suits our curriculum goals, we will eventually use the information you lay out here as the basis for building a fully-expanded curriculum.

A few important points:

1. Unit Title - Your unit title can be thematic (i.e. “The Power and Pain of Love”) or Skill-Based (i.e. Research and Argumentation) or Content-Driven (“Quadratic Functions and Operations”).

2. Uni Pacing - There are approximately forty instructional weeks in a school year, but due to testing, school events, etc., we build a curriculum to cover thirty-six weeks. A full curriculum should contain six units each a minimum of four weeks and maximum of eight weeks long. In total, the units should add up to thirty-six weeks of coverage. The only exception is ELA, which uses quarterly units each 9 weeks long.

3. Unit Overview - The unit overview is a “meaty” paragraph that provides a narrative description of the unit, including major themes, skills, and (possibly) content. Think: In this unit students will (read / do / experience / learn / understand / develop / consider /etc.)...

4. Compelling Questions - Compelling questions are essential. They reflect critical and important inquiries that help students make sense of the world around them through the lenses of specific themes, issues, and topics that connect to specific disciplines. Compelling questions are relevant. They engage students in inquiries that are of personal importance and that ask students to consider themes, issues, and topics that help them connect the content of specific disciplines to their own lives and to their world. For more information, click here.

5. Priority Learning Targets - Each unit should contain three priority learning targets. These are effectively end-of-unit guarantees of what students will be able to do and demonstrate as a result of their learning. As priority learning targets, they are those “level three” learning targets on our eventual proficiency scales that we’ve been developing for a while now. The only exception to three targets per unit are for ELA (5-6 per unit) and history (six per unit, incl. three inquiry targets). These content areas have separate curriculum guide templates

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Course Title: Grade 6 Science		
School: Thomaston Center School	**Grade: 6**	**Curriculum Pacing: 36 weeks**
Unit One: MS-ESS2 Weather & Climate (extension of Earth's Systems)	**Unit Two: MS-ETS1 Engineering Design Process**	**Unit Three: MS-LS1 Molecules to Organisms Structures and Processes**
Unit Pacing: 6 weeks	**Unit Pacing: 6 weeks**	**Unit Pacing: 6 weeks**
Unit Overview: In this unit students will examine weather and climate, with specific focus on local weather. Through this process students will develop models and collect data to show the cycling of earth's materials, and the factor's that influence and regulate weather and climate. Students will end the unit by analyzing the impact human activities have Earth's processes and structures.	**Unit Overview:** In this unit students will take on the role of an engineer, and participate in each step of the design process. First, students will analyze what the criteria and constraints are for a successful design solution, and then they will use that criteria to develop their own. The students will end the unit by developing a model to test their design, helping to solidify the importance of using data from testing to continually make improvements until the most optimal solution is created.	**Unit Overview**: This unit helps students conceptualize how cells make up all living things. Students will explore how organisms are structured, and then analyze that structure to explain how it enables life's functions. Students will also examine how cells process energy in order to create organisms, obtain matter, and then live and grow. Students will end the unit by exploring the cause and effect relationship between organisms and their environment.
Compelling Questions: **Q1:** How do the materials in/on Earth's crust change over time? **Q2:** How is weather created? **Q3:** Why is the weather like it is where we live? **Q4:** What factors influence and regulate weather and climate? **Q5:** How do living organisms alter Earth's processes and structures? **Q6:** How do Earth's major systems interact? **Understandings:**	**Compelling Questions:** **Q1:** How do engineers solve problems? **Q2:** What are the criteria and constraints of a successful solution? **Q3:** What is the process for developing potential design solutions? **Q4:** How can various design solutions be compared and improved? **Understandings:**	**Compelling Questions** **Q1:** How and why do cells work together to create systems? **Q2:** How do the structure of organisms enable life's functions? **Q3:** How do organisms obtain, and use the matter, and energy they need to live and grow? **Q4:** How do organisms detect, process, and use information about the environment? **Understandings:**

U1: Unequal heating and cooling of water, land, and air creates weather and weather patterns. **U2:** Weather can be predicted by analyzing the temperature, movements of air masses, proximity to influencing landforms/water sources, and location. **U3:** Human activities contribute to changes in the Earth's environment which can affect Earth's future.	**U1:** 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. **U2:** Parts of different solutions can be combined to create a more optimal solution. **U3:** Although one design may not perform the best, identifying characteristics of the design that performed the best in each test can provide useful information for the redesign process. **U4:** A solution needs to be tested, and then modified on the basis of the test results, in order for us to improve it.	**U1:** Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction **(MS-PS-4)**. **U2:** Plants, algae, and many microorganisms use the energy from light to make sugars (food) from carbon dioxide, the atmosphere, and water through the process of photosynthesis, which also releases oxygen (**MS.LS1.6).** **U3:** The chemical reaction that allows plants to produce complex food molecules (sugars) requires an energy input (ie: from sunlight) to occur (**MS.LS1.6).** **U4:** In this reaction, carbon dioxide and water combine to form carbon based organic molecules and release oxygen (**MS.LS1.6).**
Priority Learning Targets: I can develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process, with specific focus on the rock cycle **(MS.ESS2.1)** I can collect data to provide evidence for how the motion and complex interactions of air masses results in changes in weather conditions **(MS.ESS2.5)** I can develop and use a model to describe how unequal heating rotations of the earth cause patterns of circulation that determine climate **(MS.ESS2.6)** I can explain how weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. **(MS.ESS2.6.D1)**	**Priority Learning Targets:** I can analyze relevant scientific principles and potential impacts on people and the natural environment to identify limitations in possible solutions **(MS.ETS1.1)**. I can evaluate and define competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem **(MS.ETS1.1)**. **(MS.ETS1.2).** I can develop a model to continually test and improve (iterative testing) my solution of a proposed object, tool, or process, so that the best design can be achieved **(MS.ETS1.3)** **(MS.ETS1.4)**.	**Priority Learning Targets:** I can construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms **(MS.LS1.5)**. I can construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and the flow of energy into and out of an organism **(MS.LS1.6)**. I can develop a model to describe how food is rearranged through chemical reactions, forming new molecules that support growth **(MS.LS1.7)**.

Unit Four: MS-LS2 Ecosystems: Interactions, Energy and Dynamics	**Unit Five: MS-ESS2 Earth and Human Activity**	**Unit Six: MS-PS1 Matter and Its Interaction**
Unit Pacing: 6 weeks	**Unit Pacing: 6 weeks**	**Unit Pacing: 6 weeks**
Unit Overview: In this unit, students will explore how organisms are dependent on environmental interactions with both living, and non-living things. Students will examine patterns, and draw conclusions on the way energy moves through various ecosystems, and how sunlight helps to balance the ecosystem. Students will end the unit by demonstrating how the growing population can impact the environment, and evaluating technological solutions designed to maintain biodiversity ecosystem services.	**Unit Overview:** This unit will follow the ecosystems unit in that students will continue to explore how humans depend on Earth's resources, and how that dependency causes both positive and negative impacts to the environment. Students will analyze data and the cause and effect relationship between the actions of humans and the rise of global temperatures. Students will end the unit by designing a method to monitor and minimize human impact on the environment at a local level.	**Unit Overview**: In this unit students will explore the properties, structure, and interactions of matter. Students will analyze the observable features of matter, and then explain how substances can combine or change [react] to make new substances. Students will end the unit by developing a model that characterizes and explains these reactions to make predictions about them.
Compelling Questions: **Q1:** What patterns of interaction exist among organisms and their environments? **Q2:** How does energy move through various ecosystems? **Q3:** What role does sunlight play in a balanced ecosystem? **Q4:** How can we use technology to sustain life? **Q5:** How will the growing human population impact the environment? **Understandings:** **U1:** Ecosystems are an interconnected system that requires balance. **U2:** Changes in biodiversity can influence our food, energy, medicines, and ecosystem. **U3:** Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving things.	**Compelling Questions:** **Q1:** How do humans depend on the Earth's resources? **Q2:** How do humans change the planet? **Q3:** How do people model and predict the effects of human activities on Earth's climate? **Q4:** How can we reduce our negative impact on the Earth as we use vital resources. **Understandings:** **U1:** Changes to the Earth's environment can have positive or negative impacts. **U2:** Humans depend on Earth's land, ocean, and biosphere. **U3:** Humans activities have significantly damaged and destroyed natural habitats, causing extinction of other species. **U4:** Reducing the level of climate change	**Compelling Questions** **Q1:** How can you explain the structure, properties, and interactions of matter? **Q2:** How do particles combine to form the variety of matter you observe? **Q3:** How do substances combine or change [react] to make new substances? **Q4:** How can we characterize and explain these reactions to make predictions about them? **Understandings:** **U1:** Different kinds of matter exist. **U2:** Heating or cooling a substance can cause physical changes that we can observe. **U3:** Substances are made from different types of atoms, which combine with one another in many ways **(MS.PS1.1).** **U4:** Some chemical reactions release energy, others store energy **(MS.PS1.1).**

	depends on analyzing climate science, engineering capabilities, and human behavior.	**U5:** Each pure substance has characteristic physical and chemical properties (for any given conditions) that can be used to identify it **(MS.PS1.2-3).**
Priority Learning Targets: I can analyze and interpret data to explain the cause and effect relationships between resources and the growth of individual organisms **(MS.LS2.1).** I can construct an explanation that predicts patterns of interactions across multiple ecosystems **(MS.LS2.2).** I can develop a model to show the cycling of matter and flow of energy in an ecosystem **(MS.LS2.3).** I can use data to explain how changes to physical or biological components of an ecosystem affect populations **(MS.LS2.4).** I can evaluate solutions (technology) designed to maintain biodiversity and ecosystem services **(MS. LS2.5).**	**Priority Learning Targets:** I can explain how humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources **(MS.ESS3.1)**. I can explain how minerals, fresh water, and biosphere resources are limited, and may not be renewable or replaceable over human lifetimes **(MS.ESS3.1)**. I can explain how changes to Earth's environments can have impacts (negative and positive) for different living things **(MS.ESS3.3)**. I can apply scientific principles to design a method for monitoring and minimizing human impact on the environment, reducing the level of climate change and the negative impact on Earth's environment **(MS.ESS3.3,5).** I can construct an argument to explain how the rise in human population increases the consumption of natural resources **(MS.ESS3.4).** I can ask questions to investigate the factors that have caused a rise in global temperatures over the past century **(MS.ESS3.5).**	**Priority Learning Targets:** I can develop a model to describe the atomic composition of simple molecules and extended structures. **(MS.PS1.1)** I can explain how substances are made from different types of atoms, which combine with one another in various ways. **(MS.PS1.1)** I can analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. **(MS.PS1.2)** I can show how substances react chemically in characteristic ways. **(MS.PS1.2-5)** I can design a project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes **(MS.PS1.6)**.