Shelby County Schools Science Vision
Shelby County Schools' vision of science education is to ensure that from early childhood to the end of the 12th grade, all students have heightened curiosity and an increased wonder of science; possess sufficient knowledge of science and engineering to engage in discussions; are able to learn and apply scientific and technological information in their everyday lives; and have the skills such as critical thinking, problem solving, and communication to enter careers of their choice, while having access to connections to science, engineering, and technology.

To achieve this, Shelby County Schools has employed The Tennessee Academic Standards for Science to craft a meaningful curriculum that is innovative and provide a myriad of learning opportunities that extend beyond mastery of basic scientific principles.

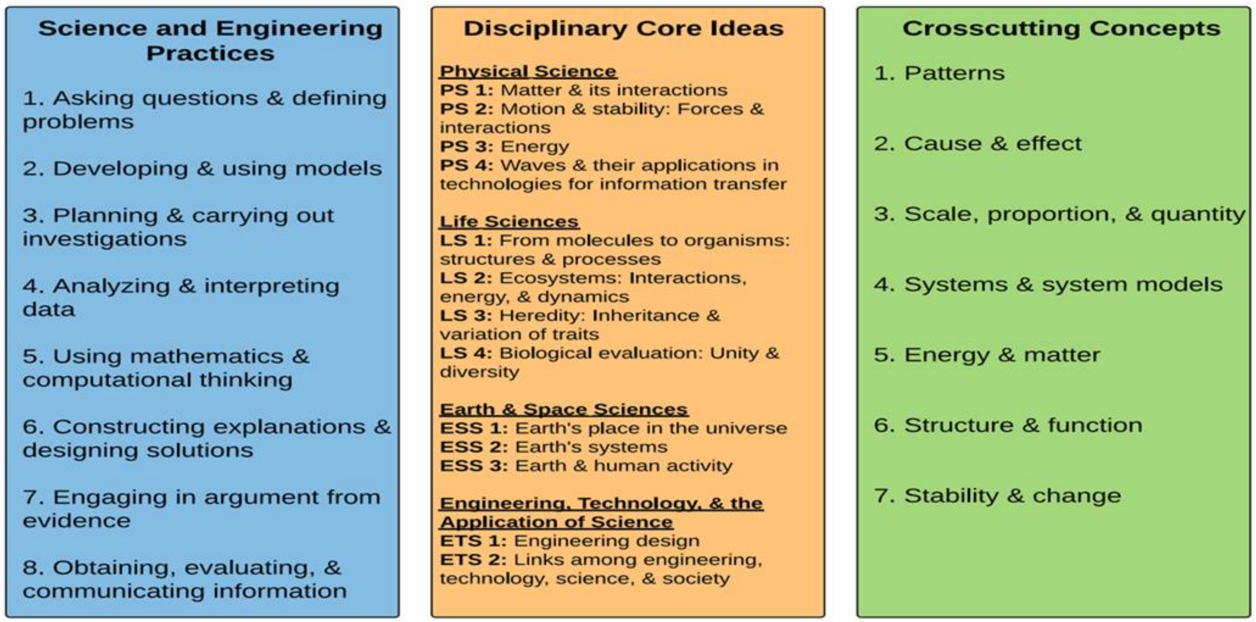
Introduction
In 2014, the Shelby County Schools Board of Education adopted a set of ambitious, yet attainable goals for school and student performance. The District is committed to these goals, as further described in our strategic plan, Destination 2025. In order to achieve these ambitious goals, we must collectively work to provide our students with high quality standards aligned instruction. The Tennessee Academic Standards for Science provide a common set of expectations for what students will know and be able to do at the end of each grade, can be located in the Tennessee Science Standards Reference. Tennessee Academic Standards for Science are rooted in the knowledge and skills that students need to succeed in post-secondary study or careers. While the academic standards establish desired learning outcomes, the curriculum provides instructional planning designed to help students reach these outcomes. The curriculum maps contain components to ensure that instruction focuses students toward college and career readiness. Educators will use this guide and the standards as a roadmap for curriculum and instruction. The sequence of learning is strategically positioned so that necessary foundational skills are spiraled in order to facilitate student mastery of the standards.

Our collective goal is to ensure our students graduate ready for college and career. Being College and Career Ready entails, many aspects of teaching and learning. We want our students to apply their scientific learning in the classroom and beyond. These valuable experiences include students being facilitators of their own learning through problem solving and thinking critically. The Science and Engineering Practices are valuable tools used by students to engage in understanding how scientific knowledge develops. These practices rest on important "processes and proficiencies" with longstanding importance in science education. The science maps contain components to ensure that instruction focuses students toward understanding how science and engineering can contribute to meeting many of the major challenges that confront society today. The maps are centered around five basic components: the Tennessee Academic Standards for Science, Science and Engineering Practices, Disciplinary Core Ideas, Crosscutting Concepts, and Phenomena.

The Tennessee Academic Standards for Science were developed using the National Research Council's 2012 publication, A Framework for K-12 Science Education as their foundation. The framework presents a new model for science instruction that is a stark contrast to what has come to be the norm in science classrooms. Thinking about science had become memorizing concepts and solving mathematical formulae. Practicing science had become prescribed lab situations with predetermined outcomes. The framework proposes a three-dimensional approach to science education that capitalizes on a child's natural curiosity. The Science Framework for K-12 Science Education provides the blueprint for developing the effective science practices. The *Framework* expresses a vision in science education that requires students to operate at the nexus of three dimensions of learning: Science and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas. The *Framework* identified a small number of disciplinary core ideas that all students should learn with increasing depth and sophistication, from Kindergarten through grade twelve. Key to the vision expressed in the *Framework* is for students to learn these disciplinary core ideas in the context of science and engineering practices. The importance of combining Science and Engineering Practices, Crosscutting Concepts and Disciplinary Core Ideas is stated in the *Framework* as follows:
Standards and performance expectations that are aligned to the framework must take into account that students cannot fully understand scientific and engineering ideas without engaging in the practices of inquiry and the discourses by which such ideas are developed and refined. At the same time, they cannot learn or show competence in practices except in the context of specific content. (NRC Framework, 2012, p. 218)
To develop the skills and dispositions to use scientific and engineering practices needed to further their learning and to solve problems, students need to experience instruction in which they use multiple practices in developing a particular core idea and apply each practice in the context of multiple core ideas. We use the term "practices" instead of a term such as "skills" to emphasize that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice. Students in

grades K-12 should engage in all eight practices over each grade band**.** Crosscutting concepts have application across all domains of science. As such, they are a way of linking the different domains of science. Crosscutting concepts have value because they provide students with connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas. There are seven crosscutting concepts that bridge disciplinary boundaries, uniting core ideas throughout the fields of science and engineering. Their purpose is to help students deepen their understanding of the disciplinary core ideas and develop a coherent and scientifically based view of the world.

The map is meant to support effective planning and instruction to rigorous standards. It is *not* meant to replace teacher planning, prescribe pacing or instructional practice. In fact, our goal is not to merely "cover the curriculum," but rather to "uncover" it by developing students' deep understanding of the content and mastery of the standards. Teachers who are knowledgeable about and intentionally align the learning target (standards and objectives), topic, text(s), task, and needs (and assessment) of the learners are best-positioned to make decisions about how to support student learning toward such mastery. Teachers are therefore expected--with the support of their colleagues, coaches, leaders, and other support providers--to exercise their professional judgment aligned to our shared vision of effective instruction, the Teacher Effectiveness Measure (TEM) and related best practices. However, while the framework allows for flexibility and encourages each teacher/teacher team to make it their own, our expectations for student learning are non-negotiable. We must ensure all of our children have access to rigor—high-quality teaching and learning to grade level specific standards, including purposeful support of literacy and language learning across the content areas.



Learning Progression

At the end of the elementary science experience, students can observe and measure phenomena using appropriate tools. They are able to organize objects and ideas into broad concepts first by single properties and later by multiple properties. They can create and interpret graphs and models that explain phenomena. Students can keep notebooks to record sequential observations and identify simple patterns. They are able to design and conduct investigations, analyze results, and communicate the results to others. Students will carry their curiosity, interest and enjoyment of the scientific world view, scientific inquiry, and the scientific enterprise into middle school.

At the end of the middle school science experience, students can discover relationships by making observations and by the systematic gathering of data. They can identify relevant evidence and valid arguments. Their focus has shifted from the general to the specific and from the simple to the complex. They use scientific information to make wise decision related to conservation of the natural world. They recognize that there are both negative and positive implications to new technologies.

As an SCS graduate, former students should be literate in science, understand key science ideas, aware that science and technology are interdependent human enterprises with strengths and limitations, familiar with the natural world and recognizes both its diversity and unity, and able to apply scientific knowledge and ways of thinking for individual and social purposes.

Structure of the Standards

- Grade Level/Course Overview: An overview that describes that specific content and themes for each grade level or high school course.
- Disciplinary Core Idea: Scientific and foundational ideas that permeate all grades and connect common themes that bridge scientific disciplines.
- Standard: Statements of what students can do to demonstrate knowledge of the conceptual understanding. Each performance indicator includes a specific science and engineering practice paired with the content knowledge and skills that students should demonstrate to meet the grade level or high school course standards.

Purpose of Science Curriculum Maps

This map is a guide to help teachers and their support providers (e.g., coaches, leaders) on their path to effective, college and career ready (CCR) aligned instruction and our pursuit of Destination 2025. It is a resource for organizing instruction around the Tennessee Academic Standards for Science, which defines what to teach and what students need to learn at each grade level. The map is designed to reinforce the grade/course-specific standards and content (scope) and provides *suggested* sequencing, pacing, time frames, and aligned resources. Our hope is that by curating and organizing a variety of standards-aligned resources, teachers will be able to spend less time wondering what to teach and searching for quality materials (though they may both select from and/or supplement those included here) and have more time to plan, teach, assess, and reflect with colleagues to continuously improve practice and best meet the needs of their students.

The map is meant to support effective planning and instruction to rigorous standards. It is *not* meant to replace teacher planning, prescribe pacing or instructional practice. In fact, our goal is not to merely "cover the curriculum," but rather to "uncover" it by developing students' deep understanding of the content and mastery of the standards. Teachers who are knowledgeable about and intentionally align the learning target (standards and objectives), topic, text(s), task, and needs (and assessment) of the learners are best-positioned to make decisions about how to support student learning toward such mastery. Teachers are therefore expected--with the support of their colleagues, coaches, leaders, and other support providers--to exercise their professional judgment aligned to our shared vision of effective instruction, the Teacher Effectiveness Measure (TEM) and related best practices. However, while the framework allows for flexibility and encourages each teacher/teacher team to make it their own, our expectations for student learning are non-negotiable. We must ensure all of our children have access to rigor—high-quality teaching and learning to grade level specific standards, including purposeful support of literacy and language learning across the content areas.

Physical World Concepts Quarter 2 Curriculum Map Curriculum Map Feedback Survey			
Quarter 1	**Quarter 2**	Quarter 3	Quarter 4
Unit 1 Motion and Stability: Forces and Interaction	**Unit 2 Energy**	Unit 3 Waves and Their Applications in Technologies for Information Transfer	Unit 4 Matter and Its Interactions
9 weeks	**9 weeks**	9 weeks	9 weeks

Unit 2: Energy [9 weeks]			
Overarching Question(s)			
How is energy transferred and conserved?			
Unit, Lesson	**Lesson Length**	**Essential Question**	**Vocabulary**
Unit 2 Energy	**7 days**	• How can understanding various physical properties about motion be useful in understanding everyday occurrences? • What variables can you manipulate to affect the movement of objects?	Force, Work, Power, Potential & Kinetic Energy

Standards and Related Background Information	**Instructional Focus**	**Instructional Resources**
DCI PS3: Energy **Standard** **PWC.PS3.1** Investigate the definitions of force, work, power, kinetic energy, and potential energy **PWC.PS3.2** Analyze the characteristics of energy and conservation of energy including friction, gravitational potential energy, and kinetic energy. **Misconceptions** • Kinetic energy depends on the direction of motion. • Energy is truly lost in many energy transformations. • There is no relationship between matter and energy.	**Learning Outcomes** • Explore characteristics of rectilinear motion and create distance-time graphs and velocity-time graphs. • Analyze vector diagrams • Recognize the difference between the scientific and ordinary definitions of work. • Define work by relating it to force and displacement. • Identify where work is being performed in a variety of situations. • Calculate the net work done when many forces are applied to an object. • Relate the variables of work, power, kinetic energy, and potential energy to mechanical situations and solve for these variables. **Phenomenon**	**Curricular Resources** **Engage** Animation: Kinetic Energy **Explore** Inquiry Lab: Potential and Kinetic Energy Virtual Lab: Potential and Kinetic Energy Open Inquiry: Work Virtual Lab: Work and Mechanical Energy **Explain** **Elaborate** **Evaluate** **Textbook** **No Textbook for This Subject**

• Energy can be changed completely from one form to another (no energy losses). • An object at rest has no energy. • The only type of potential energy is gravitational. • Gravitational potential energy depends only on the height of an object. • Doubling the speed of a moving object doubles the kinetic energy. **<u>Science and Engineering Practice</u>** 2. Developing and using models 3. Planning and Carrying Out Investigations **<u>Cross Cutting Concepts</u>** 3.Systems and System Models		

Physical World Concepts Quarter 1 Curriculum Map Curriculum Map Feedback Survey			
Quarter 1	**Quarter 2**	Quarter 3	Quarter 4
Unit 1 Motion and Stability: Forces and Interaction	**Unit 2 Energy**	Unit 3 Waves and Their Applications in Technologies for Information Transfer	Unit 4 Matter and Its Interactions
9 weeks	**9 weeks**	9 weeks	9 weeks

Unit 2: Energy [9 Weeks]			
Overarching Question(s)			
How can one explain and predict interactions between objects and within systems of objects?			
Unit, Lesson	**Lesson Length**	**Essential Question**	**Vocabulary**
Unit 2 Energy	**7 days**	• How is mechanical energy different from the other forms of energy? • In what ways is kinetic energy different from gravitational potential energy? • How are energy transfers and energy transformations alike and different?	Energy, Mechanical energy, Kinetic energy, Potential energy, Gravitational Potential energy, Energy transfer, Energy transformation
Standards and Related Background Information		**Instructional Focus**	**Instructional Resources**

DCI

PS3: Energy

Standard

PWC.PS3.4 Describe various ways in which energy is transferred from one system to another (mechanical contact, thermal conduction, and electromagnetic radiation).

PWC.PS3.6 Calculate quantitative relationships associated with the conservation of energy.

Misconceptions

- kinetic energy depends on the direction of motion.
- Energy is truly lost in many energy transformations.
- There is no relationship between matter and energy.
- Energy can be changed completely from one form to another (no energy losses).
- An object at rest has no energy.
- The only type of potential energy is gravitational.
- Gravitational potential energy depends only on the height of an object.
- Doubling the speed of a moving object doubles the kinetic energy.

Science and Engineering Practice

3. Planning and Carrying Out Investigations
4. Analyzing and Interpreting Data
5. Using Mathematics and computational thinking

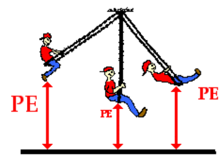
Cross Cutting Concepts

3. Systems and System Models
4. Scale, Proportion, and Quantity

Learning Outcomes

- Identify several forms of energy.
- Calculate kinetic energy for an object.
- Apply the work–kinetic energy theorem to solve problems.
- Distinguish between kinetic and potential energy.
- Classify different types of potential energy.
- Calculate the potential energy associated with an object's position.

Phenomenon



Curricular Resources

Engage

Animation: Kinetic Energy

Explore

Inquiry Lab: Potential and Kinetic Energy

Virtual Lab: Potential and Kinetic Energy

Explain

Elaborate

Evaluate

Textbook

No Textbook for This Subject

Physical World Concepts Quarter 2 Curriculum Map

Curriculum Map Feedback Survey

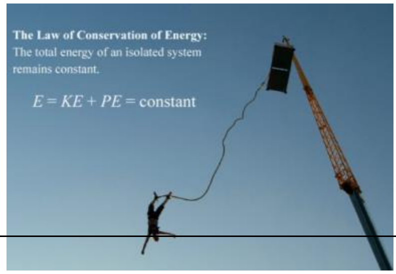
Quarter 1	**Quarter 2**	Quarter 3	Quarter 4
Unit 1 Motion and Stability: Forces and Interaction	**Unit 2 Energy**	Unit 3 Waves and Their Applications in Technologies for Information Transfer	Unit 4 Matter and Its Interactions
9 weeks	**9 weeks**	9 weeks	9 weeks

Unit 2 Energy [9 weeks]

Overarching Question(s)

What is meant by conservation of energy? How is energy transferred between objects or systems?

Unit, Lesson	Lesson Length	Essential Question(s)	Vocabulary
Unit 2 Energy	**10 days**	• How do organisms obtain energy? • How can we trace the flow of energy from "beginning" to "end"? • How can energy chains help illustrate efficient consumption of energy?	Law of Conservation of Energy, mechanical energy, electrical energy, chemical energy, nuclear energy, energy chain

Standards and Related Background Information	Instructional Focus	Instructional Resources
<u>DCI</u> PS3: Energy **<u>Standard</u>** **PWC.PS3.7** Describe various ways in which matter and energy interact. **PWC.PS3.3** Compare and contrast the following ways in which energy is stored in a system: mechanical, electrical, chemical, and nuclear. **PWC.PS3.5** Demonstrate how or explain that energy is conserved in an isolated system even if transformations occur within the system (i.e., chemical to electrical, electrical to mechanical). **<u>Misconceptions</u>**	**<u>Learning Outcomes</u>** • Summarize the key points of the Law of Conservation of Energy • Understand and use content-specific vocabulary related to the Law of Conservation of Energy • Identify situations in which conservation of mechanical energy is valid. • Recognize the forms that conserved energy can take. • Solve problems using conservation of mechanical energy **<u>Phenomenon</u>** The Law of Conservation Of Energy 	**Curricular Resources** **<u>Engage</u>** **<u>Explore</u>** **Lab:** Conservation of Mechanical Energy **Virtual Lab**: Conservation of energy **<u>Explain</u>** **<u>Elaborate</u>** **<u>Evaluate</u>** **<u>Textbook</u>** **No Textbook for This Subject**

• If energy stays in system, energy will be conserved. • Energy degradation means decreasing in its quantity. • Energy degradation is opposite to energy's conservation. • Energy conservation means saving. • Energy is truly lost in many energy transformations. **<u>Science and Engineering Practice</u>** 8. Obtaining, evaluating, and communicating information **<u>Cross Cutting Concepts</u>** 3. Energy and Matter		

Physical World Concepts Quarter 2 Curriculum Map Curriculum Map Feedback Survey			
Quarter 1	**Quarter 2**	Quarter 3	Quarter 4
Unit 1 Motion and Stability: Forces and Interaction	**Unit 2** **Energy**	Unit 3 Waves and Their Applications in Technologies for Information Transfer	Unit 4 Matter and Its Interactions
9 weeks	**9 weeks**	9 weeks	9 weeks

Unit 2 Energy [9 weeks]			
Overarching Question(s)			
What is meant by conservation of energy? How is energy transferred between objects or systems?			
Unit, Lesson	**Lesson Length**	**Essential Question(s)**	**Vocabulary**
Unit 2 **Energy**	**6 days**	• Do electric companies really sell "electricity"? • When a battery dies does it run out of charge? • Which has more resistance a 20W light bulb or a 60W light bulb? • Why are Christmas lights wired in series, but house lights wired in parallel?	Series, parallel, current, electrical potential, resistance, ohms
Standards and Related Background Information		**Instructional Focus**	**Instructional Resources**

DCI

PS3: Energy

Standard

PWC.PS3.8 Mathematically quantify the relationship among electrical potential, current, and resistance in an ohmic system.

Misconceptions

- Pure water can conduct electricity faster.
- Iron is the best conductor of electricity.
- Only magnets make magnetic field.
- As potential difference increases flow of electricity decreases.
- Potential difference has no connection with electricity flow

Science and Engineering Practice

8. Obtaining, evaluating, and communicating information

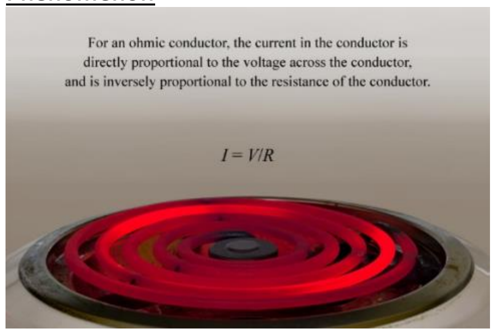
Cross Cutting Concepts

2. Energy and Matter

Learning Outcomes

- Distinguish among electric forces, electric charges, and electric fields.
- Explore static and current electricity.
- Investigate Ohm's law.
- Compare and contrast series and parallel circuits.
- Analyze components of electrical schematic diagrams
- Investigate magnetic poles, magnetic fields, and function. electromagnetic induction.

Phenomenon



Curricular Resources

Engage

Explore

Lab: Ohm's Law

Skill Practice Lab: Current and Resistance

Virtual Lab: Ohm's Law

Explain

Elaborate

Evaluate

Textbook

No Textbook for This Subject

Physical World Concepts Quarter 2 Curriculum Map Curriculum Map Feedback Survey			
Quarter 1	**Quarter 2**	Quarter 3	Quarter 4
Unit 1 Motion and Stability: Forces and Interaction	**Unit 2** **Energy**	Unit 3 Waves and Their Applications in Technologies for Information Transfer	Unit 4 Matter and Its Interactions
9 weeks	**9 weeks**	9 weeks	9 weeks
Unit 2 Energy [9 weeks]			
Overarching Question(s)			
What is meant by conservation of energy? How is energy transferred between objects or systems?			
Unit, Lesson	**Lesson Length**	**Essential Question(s)**	**Vocabulary**

<table>
<tr><td>Unit 2
Energy</td><td>7 days</td><td>• What is thermodynamics?
• What impact do the Laws of Thermodynamics have on machines?
• How is the temperature of a substance related to the thermal energy of its atoms?
• What is the underlining principle behind the movement of heat by conduction, convection and radiation?</td><td>First Law of Thermodynamics, Thermal energy, Specific heat, Temperature, Entropy, Reversibility, Internal energy, Enthalpy, Steady State, Equilibrium</td></tr>
<tr><th colspan="2">Standards and Related Background Information</th><th>Instructional Focus</th><th>Instructional Resources</th></tr>
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PS3: Energy

<u>Standard</u>
PWC.PS3.9 Relate the first law of thermodynamics as an application of the law of conservation of energy.

<u>Misconceptions</u>
• Any system could be 99.99% efficient
• Any system can be run reversibly
• Internal energy and enthalpy are interchangeable
• Steady state and equilibrium are interchangeable terms.
• Factors which impact how quickly a reaction occurs also impact how much product is created.
<u>Science and Engineering Practice</u>
2. Developing and using models
5. Using Mathematics and computational thinking

<u>Cross Cutting Concepts</u>
1. Stability and Change
2. Energy and Matter</td><td><u>Learning Outcomes</u>
• Illustrate how the first law of thermodynamics is a statement of energy conservation.
• Calculate heat, work, and the change in internal energy by applying the first law of thermodynamics.

<u>Phenomenon</u>
The First Law of Thermodynamics
$\Delta U = Q - W$

Change in system's internal energy = energy transferred to or from system as heat − energy transferred to or from system as work</td><td><u>Curricular Resources</u>
<u>Engage</u>
Web Resource: Thermodynamics
Video: Thermodynamics

<u>Explore</u>

<u>Explain</u>

<u>Elaborate</u>

<u>Evaluate</u>

<u>Textbook</u>
No Textbook for This Subject</td></tr>
</table>

Unit 1 Motion and Stability: Forces and Interaction	**Unit 2 Energy**	Unit 3 Waves and Their Applications in Technologies for Information Transfer	Unit 4 Matter and Its Interactions
9 weeks	**9 weeks**	9 weeks	9 weeks
Unit 2: Energy [9 weeks]			
Overarching Question(s)			
What is meant by conservation of energy? How is energy transferred between objects or systems?			

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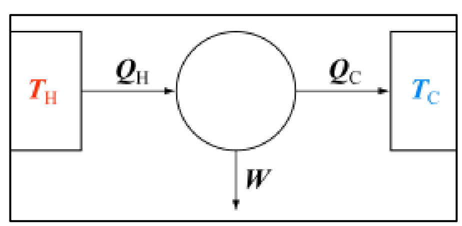
Unit, Lesson	Lesson Length	Essential Question(s)	Vocabulary
Unit 2 **Energy**	8 days	• How is a calorimeter used to measure energy that is absorbed or released? • What do enthalpy and enthalpy change mean in terms of chemical reactions and processes? • How is energy lost or gained during changes of state? • How is the heat that is absorbed or released in a chemical reaction calculated? • How is Hess's law applied to calculate the enthalpy change for a reaction? • What is the difference between spontaneous and non-spontaneous processes?	Second Law of Thermodynamics, Thermal energy, Specific heat, Temperature, Entropy, Reversibility, Internal energy, Enthalpy, Steady State, Equilibrium.

Standards and Related Background Information	Instructional Focus	Instructional Resources
<u>DCI</u> PS3: Energy **<u>Standard</u>** PWC.PS3.10 Analyze the relationship between energy transfer and disorder in the universe (second law of thermodynamics). **<u>Misconceptions</u>** • Entropy is a measure of disorder. • The second law will bring the world to "heat death," namely thermal equilibrium in which no energy will flow. • Any system could be 99.99% efficient • Any system can be run reversibly • Internal energy and enthalpy are interchangeable • Steady state and equilibrium are interchangeable terms.	**<u>Learning Outcomes</u>** • Recognize why the second law of thermodynamics requires two bodies at different temperatures for work to be done. • Calculate the efficiency of a heat engine. • Relate the disorder of a system to its ability to do work or transfer energy as heat. **<u>Phenomenon</u>**  	**Curricular Resources** **<u>Engage</u>** Web Resource: Thermodynamics **<u>Explore</u>** Lab: Entropy and Probability **<u>Explain</u>** **<u>Elaborate</u>** **<u>Evaluate</u>** **<u>Textbook</u>** **No Textbook for This Subject**

• Factors which impact how quickly a reaction occurs also impact how much product is created. **<u>Science and Engineering Practice</u>** 8. Obtaining, evaluating, and communicating information **<u>Cross Cutting Concepts</u>** 3. Energy and Matter		

No textbook for this subject		
RESOURCE TOOLKIT		
Quarter 2 Physical World Concept		
DCIs PS3: Energy **Standard(s)** PWC.PS3.1 PWC.PS3.2 PWC.PS3.3 PWC.PS3.4 PWC.PS3.5 PWC.PS3.6 PWC.PS3.7 PWC.PS3.8 PWC.PS3.9 PWC.PS3.10	**Websites/ Videos** Kinetic Energy https://my.hrw.com/content/hmof/science/hss2017/tn/gr912/hmd_phy_9781328833716_/dlo/animatedphysics/p05_02as157/index.html Potential and Kinetic Energy: https://dcmp.org/guides/TID7457.pdf http://www.glencoe.com/sites/common_assets/science/virtual_labs/PS05/PS05.html Acceleration https://my.hrw.com/content/hmof/science/hss2017/tn/gr9-12/hmd_phy_9781328833716_/dlo/animatedphysics/p02_02as153/index.html Motion https://my.hrw.com/content/hmof/science/hss2017/tn/gr9-12/hmd_phy_9781328833716_/teacher/tabpages/teacher/data/chap02/hssp0200t_lab.pdf Conservation of Mechanical Energy: https://my.hrw.com/content/hmof/science/hss2017/tn/gr9-12/hmd_phy_9781328833716_/teacher/tabpages/teacher/data/chap05/hssp0503t_coreskilllab.pdf Conservation of energy: https://my.hrw.com/content/hmof/science/hss2017/tn/gr9-12/hmd_phy_9781328833716_/nsmedia/polyhedron_virtual_labs/conservationofenergy/coehomeframeset.html Thermodynamics: https://www.youtube.com/watch?v=jKyCHZYnXno http://hmdscienceexplore.hmhco.com/physics/ch10/	**Additional Resources** **ACT & SAT** TN ACT Information & Resources ACT College & Career Readiness Mathematics Standards SAT Connections SAT Practice from Khan Academy Khan Academy Illuminations (NCTM) Discovery Education The Futures Channel The Teaching Channel Teachertube.com