Shrewsbury Borough School District
Science Curriculum Guide
Grade 8
2015

Mission Statement:

The mission of the Shrewsbury Borough School District, a system built on successful cooperation among family, school and community, is to prepare all students to achieve excellence and to become responsible citizens through rigorous educational programs consistent with New Jersey Core Content State Standards and which respect individual differences and diversity. Students will be prepared to meet the challenges presented in the regional high school and the world beyond.

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August 2015

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Implementation: September 2015

Course Philosophy:

In 8th grade physical science, the performance expectations at the middle school level focus on students developing understanding of several scientific practices. These include developing and using models, planning and conducting investigations, analyzing and interpreting data, using mathematical and computational thinking, and constructing explanations. Students are also expected to demonstrate an understanding of engineering practices including design and evaluation.

Course Description:

This 8th grade physical science course description focuses on four main areas: matter, forces and motion, energy, and waves. The performance expectations in physical science build on the K-5 ideas and capabilities to allow learners to explain phenomena central to physical sciences but also to the life and earth and space science. The performance expectations blend the core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge to explain real life phenomena in the physical, biological, and earth and space sciences. The students will understand: how atomic and molecular interactions explain the properties of matter that we see and feel; why some objects keep moving, why some objects fall to the ground, and why some materials attract to each other while others do not; how energy can be transferred from one object to another and that objects that are moving have kinetic energy and objects may also contain stored energy; and the properties of waves and how they can be used.

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Scope and Sequence	
Course Title: Physical Science	Grade Level: 8

Units:

Unit 1: Motion and Stability	September-October
Unit 2: Matter and Its Interactions	November-January
Unit 3: Energy	February-April
Unit 4: Waves and Their Applications in Technologies for InformationTtransfer	May-June

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Unit 2 Overview
Unit Title: Matter and Its Interactions
Grade Level: 8
Recommended Pacing: 3 months, November- January
Unit Summary: Matter can be classified by what it is made of, by its physical properties, and by its chemical properties. Many physical properties of matter can be described by the motion of its particles and the states of matter. The properties of an element are determined by the composition of its atoms. Elements can be classified into three main types-metals, nonmetals, and metalloids. Protons and neutrons are held together in a nucleus by the strong nuclear force. A chemical reaction involves changing one or more substances into a different substance or substances. The law of conservation of matter states that matter is not created or destroyed**.** In a chemical reaction, the amount of matter before the reaction is the same as after the reaction.
NGSS: MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

ISTE Standards:

Creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making.

Science and Engineering Practices:

Developing and using models; analyzing and interpreting data; constructing explanations and designing solutions; obtaining, evaluating, and communicating information.

Unit Essential Questions:

What properties define matter?
What are physical and chemical properties of matter?
What are physical and chemical changes of matter?
How do pure substances and mixtures compare?
How do particles in solids, liquids, and gases move?
How can matter be classified?
What are elements?
What are the parts of an atom?
How are the elements organized?
What information is contained in each square on the periodic table?
How are the elements arranged on the periodic table?
What are the reactants and products in a chemical reaction?
What is the law of conservation of mass?
What are nuclear processes?

Unit Learning Targets

Students will know…

- Matter is anything that has mass and takes up space.
- Matter can be either a pure substance (an element or a compound) or a mixture (either heterogeneous or homogeneous).
- A pure substance is made up of elements and compound. A mixture is a combination of substances that are combined physically, but not chemically. A mixture can be homogeneous (the same throughout) or heterogeneous (are not the same throughout. An example of a homogeneous mixture is a solution. An example of a

Unit Learning Targets

Students will do…

- Read, take notes, and discuss material.
- Watch and participate in Brain Pop videos and quizzes.
- Listen to Flocabulary raps and Mr. Edmond's science songs.
- Inquiry labs, kinesthetic activities, demonstrations.
- Observe and describe matter with everyday items.

heterogeneous mixture is a suspension. • A physical property can be observed without changing the identity of the material. A chemical property describes whether it can undergo a chemical change. A physical change is a change of matter from one form to another without a change in the chemical properties. A chemical change is a change of matter that occurs when one or more substances changes into an entirely new substance with different properties. • Solids, liquids, and gases differ by the amount of thermal energy their particles have. In solids, particles vibrate in place. In liquids, particles slide past one another. In gases, particles move freely. • Adding or removing heat can change the properties of matter. • Matter can be classified into elements, compounds, and mixtures. • Elements are made up of atoms. • Protons and neutrons are located in an atom's nucleus, and electrons are located in an electron cloud. All atoms of the same element have the same number of protons but can have different numbers of neutrons. Atoms of elements are in the same group on the periodic table contain the same number of outer energy level electrons.	• Four corners: Put up signs that say solid, liquid, gas, none. Hand out papers assessing students' prior knowledge before teaching topic and after understanding. Call out descriptions and students go to corner based on their knowledge. • Petri dishes: students fill in petri dishes with objects to demonstrate the molecular structure of solids, liquids, gases. • Up and "ATOM" poster: students model an atomic model of a particular element. • The ATOMS family song to the tune of the ADDAMS family. • Musical chairs to demonstrate nucleus, protons, neutrons, and electrons. Musical chairs to demonstrate ions and isotopes. • "What's the MATTER in 8th grade? EVERYTHING." Project: Divide paper into 6 parts. Make a visual representation of elements, compounds, heterogeneous and homogenous mixtures, solutions, suspensions. • Make lemonade to demonstrate solutions. Make chex mix to demonstrate mixtures. • Properties game: use True and False cards. Teacher provides short statements, students hold up T or F car.

• Elements can be classified into three main types: metals, nonmetals, and metalloids. Metals are located on the left side of the periodic table and are generally shiny, good conductors, malleable, and ductile. Nonmetals are located on the right side of the periodic table and are generally dull, poor conductors, and brittle. Metalloids share properties of both metals and nonmetals. A period is the row the elements are in. • The rearrangement of atoms in a chemical change is described by a chemical equation. A balanced chemical equation contains the same numbers and types of atoms in the reactants as in the products. • The law of conservation of matter states that matter is not created or destroyed. In a chemical reaction, the amount of matter before the reaction is the same as after the reaction. • Nuclear fission splits nuclei apart and nuclear fusion joins nuclei together.	• Use a piece of yarn to make a circle on floor that represents nucleus. Each student receives a paper that says either PROTON, NEUTRON, or ELECTRON. Students have to find their correct spot. • Bag of matter: pupils look at items and discuss their physical and chemical properties. • It's "ELEMENT"ary project: students research an element, who discovered it, where its found, what its used in, and its physical/chemical properties and changes. • Electron dot diagrams. • "Wanted ___ electrons to borrow" (Ionic bond poster). Students make a poster showing electron dot diagram, identify +/- ions, and atomic model. • "Weighing in": balancing equations steps and practice problems.

Evidence of Learning

Formative Assessments:

- Socratic method
- student generated and teacher created notes
- homework pages from Glencoe Science workbook
- Brain Pop quizzes
- SWAT-IT review game
- Chapter 15, 17, 19, 20, 21 study guides
- Lab work

Summative Assessments:

- Written laboratory reports (see Lab activities section)
- Glencoe Science chapter tests: 15, 17, 19, 20, 21
- Project Based Learning (see section on "Students will do")

Lab Activities:

1. Similar but different lab (Science Fusion TE: Matter, unit 1, lesson 1)
2. Using water displacement to illustrate volume of objects (Science Fusion TE: Matter, unit 1, lesson 1)
3. Classification of matter (science kit)
4. Mix it up! ((Science Fusion TE: Matter, unit 1, lesson 4)
5. Conservation of mass in chemical changes
6. Observing properties of metals and nonmetals (especially conductivity) (McGraw Hill Physical Science textbook, chapter 10))

Materials/Equipment:
Required Lab Materials: 1. Triple beam balance, similar shapes and sizes of objects 2. Water, graduated cylinder, objects 3. Filled bottles with assorted types of matter: glue, gravel, sand, salt and water, etc. 4. Sugar, salt, water, beakers, oil 5. Beakers, vinegar, balloons, baking soda, triple beam balance 6. Burner, tongs, metal, glass, wood, ice. Safety goggles, lab apron
Materials/Equipment/Resources: • Lab materials from 1-6. See above. • Computer, smart board, laptops • Paper, markers, glue, stickers, petri dishes, pom poms, art materials • Glencoe Science Physical Science textbook and workbook • McGraw Hill Physical Science textbook • Science Fusion Teacher edition (Matter and Energy) • BrainPop, Flocabulary, YouTube

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Unit 1 Overview

Title:
Motion and Stability

Grade Level:
8

Recommended Pacing:
2 months: September-October

Unit Summary:
Motion occurs when an object changes its position.
Newton's Laws of Motion connect the change in an object's motion with the forces acting on it.

NGSS:
MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

ISTE Standards:
Creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making.

Science and Engineering Practices:

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Asking questions and defining problems; planning and carrying out investigations; constructing explanations and designing solutions; engaging in argument from evidence.

Unit Essential Questions:	
How can you describe the location of an object? What is motion? What is speed? What is average speed and how is it calculated? How is constant speed graphed? What is velocity? How is changing velocity measured? How is average acceleration calculated? How can accelerating object change velocity? What is a force and how does it act on an object? What happens when multiple forces act on an object? What is Newton's 1st Law? What is Newton's 2nd Law? What is Newton's 3rd Law? What is gravity? What determines the force of gravity? How does gravity keep objects in orbit? What are electric and magnetic forces?	
Unit Learning Targets *Students will know…* • The location of an object depends on position and reference point. • Motion is a change in position over time.	Unit Learning Targets *Students will do…* • Read, take notes, and discuss material. • Watch and participate in Brain Pop videos and quizzes.

• An object's speed depends on how far an object travels in a unit of time. • Average speed means an object may not always be moving at a constant speed. Average speed = total distance/total time • A distance time graph plots distance on the y-axis and time on the x-axis. To calculate speed using a graph, calculate the steepness/slope of the line. • Velocity is its speed in a direction. • Acceleration describes how the velocity of an object is changing. • Acceleration is measured in meters per seconds squared. Formula for acceleration is a= (final velocity – initial velocity)/ time. • Accelerating objects change speed or direction or both. • A force is a push or pull. Forces can act through direct contact or at a distance. • The net force of an object is the sum of all the forces acting on the object. When two forces act in opposite directions, the smaller force can be subtracted from the larger force to determine the net force. When all of the forces applied produce a net force of zero, the forces are	• Listen to Flocabulary raps and Mr. Edmond's science songs. • Inquiry labs, kinesthetic activities, demonstrations. • NASA posters and power point demonstration for understanding on all of Newton's laws. • Cup and marble to demonstrate Newton's 1st law. • Newton's cradle, clackers, rocket balloons, and poppers demonstrate 3rd law. • Tablecloth and dishes demonstration. • Design and build rollercoaster STEM activity. • Poster project: describe, evaluate, and draw each of the law.

balanced and no motion occurs. An object's motion changes only if the forces acting on the object are unbalanced, and the object accelerates in the direction of the net force. • Sir Isaac Newton's Laws of Motion: Newton's 1st law, also known as the Law of Inertia, states that an object at rest remains at rest and an object in uniform motion maintains its velocity unless a force acts on it. Newton's 2nd law states that the acceleration of an object depends on its mass and the magnitude of the force. F = m x a. The acceleration of an object equals the net force divided by the mass. • Newton's 3rd law states when one object exerts a force on a second object the second object exerts an equal and opposite force on the first object. Forces between two objects are always exerted in pairs. • Gravity is an attractive force that any two objects with mass exert on each other. Gravity affects mass equally. The force of gravity is F=mg, where g is the acceleration of gravity (9.8 m/s2). Earth's gravity pulls everything to the center of the Earth. Gravity is the major force determining motion and shape of celestial bodies. Gravity depends on distance and mass. Gravity can make objects move in circles. • Electric and magnetic forces can be attractive or repulsive. Their sizes depend on the magnitudes of the charges,	

currents, or magnetic strengths involved and on the distances between interacting objects. • Forces that act at a distance (electric, magnetic, gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object.	

Evidence of Learning
Formative Assessments: • Socratic method • Student generated and teacher created notes • Glencoe science workbook homework • Brain Pop quizzes • SWAT-IT review game • Chapter 2, 3 study guides • Lab work
Summative Assessments: • Written laboratory reports (see Lab activities section) • Glencoe science chapter tests 2, 3 • Project Based Learning (see above section on “Students will do”)
Lab Activities: 1. Observing inertia (Glencoe Physical Science text, chapter 2) 2. Force of gravity (Glencoe Physical Science text, chapter 3) 3. Observing centripetal force (Glencoe Physical Science text, chapter 3)

Unit 3 Overview

Required Lab Materials:

1. Inclined plane, textbooks, stop watch, stop block, doll, car, rubber bands
2. Balls, paper, triple beam balance, stopwatch
3. String, slotted ball

Safety goggles

Materials/Equipment/Resources:

- Materials for labs 1-3. See above.
- Computer, smart board, laptops
- Paper, markers, glue, art materials
- STEM rollercoaster kit from Carolina Biological Company
- Glencoe Physical Science textbook and workbook
- McGraw Hill Physical science textbook
- Science Fusion Teacher edition (Motion, Forces, and Energy)
- BrainPop, Flocabulary, YouTube

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Title: Energy
Grade Level: 8
Recommended Pacing: 3 months, February-April
Unit Summary: Every change that occurs requires energy. The energy in an energy source is transformed into other forms of energy that are used by humans.
NGSS: MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amount of potential energy are stored in the system. MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes energy is transferred to or from the object.
ISTE Standards: Creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making.
Science and Engineering Practices: Developing and using models; planning and carrying out investigations; analyzing and interpreting data; constructing explanations and designing solutions; engaging in argument from evidence

Unit Essential Questions:

What is kinetic energy?
How is kinetic energy of an object calculated?
What is potential energy? What are the 3 types of potential energy?
How is gravitational potential energy calculated?
How is the mechanical energy of an object calculated?
What is the law of conservation of energy?
How is temperature related to kinetic energy?
What is thermal energy?
What is the difference between thermal energy and temperature?
What is heat?
How is heat measured?
How is heat related to thermal energy?
How can heat affect the state of matter of an object?
What are convection, conduction, and radiation?
What are sources of energy?
What are fossil fuels?
What are some alternative sources of energy?

Unit Learning Targets

Students will know…

- Kinetic energy is the energy of motion. Kinetic energy increases as mass increases. Kinetic energy increases as speed increases.
- Kinetic energy is calculated using the equation: KE = ½ m x v squared.

Unit Learning Targets

Students will do…

- Read, take notes, and discuss material.
- Watch and participate in Brain Pop videos and quizzes.
- Listen to Flocabulary raps and Mr. Edmond's science songs.

• Potential energy is stored due to an object's position, condition, or chemical composition. Three types of potential energy are: elastic, chemical, and gravitational. Gravitational potential energy can be calculated: GPE = mgh where m= mass, g= acceleration due to gravity, and h= height of object from the ground. • Mechanical energy is kinetic energy plus potential energy. • Energy cannot be created or destroyed, but can change from one form to another. • Thermal energy is the total kinetic energy of all particles in a substance. • Temperature is related to the average kinetic energy of particles while thermal energy is the total kinetic energy of all the particles. • Heat is the energy transferred from an object at a higher temperature to an object at a lower temperature. A calorie is the amount of energy needed to raise the temperature of 1 g of water by 1 degree C. • Adding or removing heat from a substance may result in a change of state. • Conduction is the transfer of energy as heat between substances through direct contact. Convection is the transfer of energy as heat by the movement of a liquid or a	• Inquiry labs, kinesthetic activities, demonstrations. • Practice problems using formulas for kinetic and gravitational potential energy. • Project: "Wanted _____ Energy for _____ activity. Accomplice: _____ Energy." Students identify types of energy used in everyday activities. • Poppers and ping pong balls to show elastic potential energy. • Astro-blaster to demonstrate elastic potential energy and law of conservation of energy. • Build and design roller coaster STEM activity. • Four corners: which way did the energy go? Label 4 corners of classroom: conduction, convection, radiation, and none. Ask students to stand in the corner they think describes the situation: you hold a mug of hot tea and your hand starts to feel warmer, an ice cube melts in a cup of tea, etc. • Hide 100 paperclips around the room. Two students try to find as many clips in 3 trials of 30 seconds. Record data. Why does the amount of paperclips decrease during the trials? Represents our limited supply of fossil fuels.

gas. Radiation is energy transfer by electromagnetic waves. • Energy is either renewable (alternative sources of energy) or nonrenewable (fossil fuels). • Coal, natural gas, and petroleum are fossil fuels. Burning fossil fuels produces thermal energy that is converted into other useful forms of energy. • Alternative sources of energy are solar, nuclear, hydroelectric, wind, geothermal, and biomass. Renewable energy sources are not used up because they are replaced as they are used up.	• Poster on fossil fuels. Research how fossil fuel is forms, where it is found, what is used for, impact on environment, disadvantages and advantages. • Poster on renewable resources. Research type of energy, how it works, where it is found, what is used for, impact on environment, disadvantages and advantages. • Build and design solar car in cooperative groups. Test angle of solar cell. Work cooperative with math teacher for gear ratios. Students answer questions to document work on tri-board.

Evidence of Learning

Formative Assessments:

- Socratic method
- Student generated and teacher created notes
- Glencoe science workbook homework
- Brain Pop quizzes
- SWAT-IT review game
- Chapter 4, 6, 9 study guides
- Lab work

Summative Assessments:

- Written laboratory reports (see Lab activities section)
- Glencoe science chapter tests 4, 6, 9
- Project Based Learning (see above section on "Students will do")

Lab Activities:

1. Bouncing balls (Glencoe Physical Science textbook, chapter 4)
2. Comparing thermal conductors
3. Shake sand in coffee cup (McGraw Hill Physical Science textbook, chapter 5)
4. Thermal energy is a bottle (Science Fusion TE Energy and Matter, Unit 2, Lesson 3)
5. Solar house (Carolina Biological Company science kit)
6. RenewaBEANable (Renewables are Ready Teacher's Guide)
7. Solar cars (Carolina Biological Company science kit)

Materials/Equipment:
Required Lab Materials: 2. Beakers, hot plate, water, plastic, wooden, and metal spoon, beads, butter 3. Coffee cup, tape, sand, thermometer, timer 4. Balloon, plastic bottle, bowls, hot and cold water 5. Solar house, thermometer, window 6. Beans, bags, data sheets 7. Cardboard, alligator clips, solar cell, wheels, axles, rubber bands, scissors, hot glue gun, motor, multimeter Safety goggles, Lab aprons
Materials/Equipment/Resources: • Materials for labs 1-7. See above. • Computer, smart board, laptops • Paper, markers, glue, art materials • Glencoe Physical Science textbook and workbook • McGraw Hill Physical Science textbook • Science Fusion Teacher edition (Motion, Forces, and Energy) • BrainPop, Flocabulary, YouTube videos. • Documentary and audio interview of William Kamkwaba author of *The Boy Who Harnessed the Wind* • *Energy Island* by Allan Drummond • Wind Turbine • Carolina Biological science kits

Unit 4 Overview
Unit Title: Waves and Their Applications in Technologies for Information Transfer

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Grade Level: 8
Recommended Pacing: 2 months, May-June
Unit Summary: Waves transfer energy from place to place without transferring matter. Waves move through matter as energy is transferred from particle to particle. Wave properties depend on the vibrations of the wave source and the material in which the wave moves. Waves can change direction when they interact with matter. Electromagnetic waves can transfer energy through matter and space. Electromagnetic waves are transverse waves that can be produced by vibrating electric changes. Each type of electromagnetic wave has a certain range of frequencies and wavelengths. Signals and information can be transmitted using radio waves.
NGSS: MS-PS4-1.Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. MS-PS4-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. MS-PS4-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. MS-PS4-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
ISTE Standards: Creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making.
Science and Engineering Practices: Developing and using models; using mathematical and computation thinking; obtaining, evaluating, and communicating information.

Unit Essential Questions:

What are waves?
How does a wave transfer energy?
What are some types of waves?
What are the parts of a wave: wavelength, frequency, period, and amplitude?
What affects the energy of a wave?
What determines the speed of a wave?
What is an electromagnetic wave?
What is the electromagnetic spectrum?
How are waves used in communication?

Unit Learning Targets

Students will know…

- Waves are disturbances that transfer energy. A medium is the material a wave can travel through. Waves transfer energy without transferring matter.
- Waves transfer energy as a longitudinal (compression) and transverse wave. Longitudinal (compression) waves travel in the same direction as the disturbance. Transverse waves move perpendicular to the direction of a vibration.
- Some types of waves are sound, mechanical, and electromagnetic.
- Wavelength is the distance from any point on a wave to an identical point on the next wave. Frequency is the number

Unit Learning Targets

Students will do…

- Read, take notes, and discuss material.
- Watch and participate in Brain Pop videos and quizzes.
- Listen to Flocabulary and YouTube science songs.
- Inquiry labs, kinesthetic activities, demonstrations.
- Have students use coiled springs (slinkies) to model both transverse and compressional/longitudinal waves.
- To observe waves, use a large flat aluminum pan partially filled with water to observe waves. Students can blow across the surface or a fan can be used to simulate wind.

of waves or wave cycles produced in a given amount of time. Period is the time required for identical points on consecutive waves to pass a given point. Amplitude is the maximum distance that the particles of a wave's medium vibrate from their rest position. • Wave energy decreases with distance because each wave has to spread the energy more. • The speed of a mechanical wave depends on the medium. The speed of an electromagnetic wave in a vacuum is the speed of light. Speed (m/s) = frequency (Hz) X wavelength (m). • Electromagnetic waves can transfer energy through matter and space and do not need a medium. Electromagnetic waves are transverse waves that can be produced by vibrating electric charges. Electromagnetic waves are disturbances in electric and magnetic fields. • The electromagnetic spectrum is the entire range of electromagnetic wave frequencies which include radio waves, microwaves, infrared waves, visible light, ultraviolet waves, X rays, and gamma rays. • Signals and information can be transmitted using radio waves.	• Practice calculating wave speed with practice problems. • A wave of students. Have 10 students come to the front of the room to model different types of waves. • Draw and label parts of waves.

Evidence of Learning
Formative Assessments: • Socratic method • Student generated and teacher created notes • Glencoe science workbook homework • Brain Pop quizzes • SWAT-IT review game • Chapter 10, 12 study guides • Lab work
Summative Assessments: • Written laboratory reports (see Lab activities section) • Glencoe science chapter tests 10, 12 • Project Based Learning (see above section on "Students will do")
Lab Activities: 1. Water Waves (Glencoe Physical Science textbook, chapter 10) 2. Can electromagnetic waves change materials? (Glencoe Physical Science textbook, chapter 12) 3. Heating with microwaves. (Glencoe Physical Science textbook, chapter 12)

Materials/Equipment:
Required Lab Materials: 1. Tinfoil pan/rectangular container, cork, wood, water 2. Red paper, timer 3. Beakers, dry sand, water, microwave Safety goggles, lab apron
Materials/Equipment/Resources: • Lab materials from . See above. • Computer, smart board, laptops. • Paper, markers, art materials • Glencoe Physical Science textbook and workbook • McGraw Hill Physical Science textbook • Science Fusion Teacher edition (Sound and Light) • Brain Pop, Flocabulary, YouTube videos

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Scope and Sequence	
Course Title:	Grade Level:
Units:	

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Unit Overview
Unit Title:
Grade Level:
Recommended Pacing:
Unit Summary:
NGSS:
21st Century Standards:
Science/Technology Standards:

Unit Essential Questions:	
Unit Learning Targets *Students will know…*	Unit Learning Targets *Students will do…*

Evidence of Learning
Formative Assessments:
Summative Assessments:
Lab Activities:

Materials/Equipment:
Required Lab Materials:
Materials/Equipment/Resources:

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