

<b>Grade Level:</b>		8th Grade				
<b>Subject/Course:</b>		Science II				
<b>Semester</b>	<b>Topic</b>	<b>Standards</b>	<b>Skills</b>	<b>Resources/ Activities/ Materials</b>	<b>Key Terminology</b>	<b>Assessments</b>
Semester 1	What is science, the scientific method, engineering design, measurements, and lab safety	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4	<ul style="list-style-type: none"> <li>• Explain what science is (and is not).</li> <li>• Identify/describe different areas of study in science</li> <li>• Explain the scientific method</li> <li>• Describe how a hypothesis is formed &amp; tested</li> <li>• Identify ways to analyze data and communicate data</li> <li>• Explain and identify types of models</li> <li>• Describe theories and laws</li> <li>• Explain the engineering model</li> <li>• Identify tools used to collect and analyze data</li> <li>• Explain the importance of SI/metric system</li> <li>• Identify appropriate units for measurements</li> <li>• Make measurements using the SI/metric system</li> <li>• Identify safety rules and symbols</li> </ul>	<p>Holt Science &amp; Technology: Physical Science (2007)</p> <p>Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.</p>	Relevant terminology related to what is science, the scientific method, engineering design, measurements and lab safety	<p>Daily Assignments</p> <p>Labs/Activities/ Projects</p> <p>Chapter/Unit Quizzes/Tests</p>
Semester 1	<p>Motion and Forces</p> <p>Ch. 5 – Matter in Motion</p> <p>Ch. 6 – Forces in Motion</p> <p>If time allows - Ch. 7 – Forces in Fluids</p>	MS-PS2-1 MS-PS2-2 MS-PS2-4 MS-PS2-5 MS-ESS1-2	<ul style="list-style-type: none"> <li>• Describe the motion of an object by position</li> <li>• Identify factors that determine speed</li> <li>• Compare speed and velocity</li> <li>• Analyze the relationship between velocity and acceleration</li> <li>• Demonstrate that changes in motion can be measured/represented on a graph</li> <li>• Describe forces and how they act on objects</li> <li>• Determine the net force with two or more forces acting on an object</li> <li>• Compare balanced and unbalanced forces</li> <li>• Describe way that unbalanced forces cause changes in motion</li> <li>• Explain why friction occurs</li> <li>• List the types of friction and examples</li> </ul>	<p>Holt Science &amp; Technology: Physical Science (2007)</p> <p>Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.</p>	Relevant terminology related to forces and motion	<p>Daily Assignments</p> <p>Labs/Activities/ Projects</p> <p>Chapter/Unit Quizzes/Tests</p>

			<ul style="list-style-type: none"> <li>• Explain how friction can be both harmful and helpful</li> <li>• Describe gravity and its effect on matter</li> <li>• Explain the law of universal gravitation</li> <li>• Describe the difference between mass and weight</li> <li>• Explain the effect of gravity and air resistance of falling objects</li> <li>• Explain why objects in orbit are free fall and appear weightless</li> <li>• Describe how projectile motion is affected by gravity</li> <li>• Describe Newton's first law of motion</li> <li>• State Newton's second law of motion</li> <li>• State Newton's third law of motion</li> <li>• Calculate the momentum of moving objects</li> <li>• Explain the law of conservation of momentum</li> </ul> <p>If time allows the skills below will also be covered:</p> <ul style="list-style-type: none"> <li>• Describe how fluids exert pressure</li> <li>• Analyze how atmospheric pressure varies with altitude</li> <li>• Explain how depth and density affect water pressure</li> <li>• Give examples of fluid flowing from high to low pressure</li> <li>• Explain the relationship between fluid pressure and buoyant force</li> <li>• Predict whether an object will float or sink in a fluid</li> <li>• Analyze the role of density in an objects ability to float</li> <li>• Explain how the overall density of an object can be changed</li> <li>• Describe the relationship between pressure and fluid speed</li> <li>• Analyze the roles of lift, thrust and wing size in flight</li> <li>• Describe drag and how it affects lift</li> <li>• Explain Pascal's principle</li> </ul>			
Semester 1	Astronomy	MS-PS2-4 MS-ESS1-1 MS-ESS1-2 MS-ESS1-3	<ul style="list-style-type: none"> <li>• Explain the relationship between gravity and pressure in a nebula</li> <li>• Describe how the solar system formed</li> </ul>	Holt Science & Technology: Earth Science (2007)	Relevant terminology related to astronomy	Daily Assignments  Labs/Activities/

	Ch. 20 - Formation of the Solar System Ch. 21 - A Family of Planets		<ul style="list-style-type: none"> <li>Describe the basic structure and composition of the sun</li> <li>Explain how the sun generates energy</li> <li>Describe the surface activity of the sun, and identify how this activity affects the Earth</li> <li>Describe the formation of the solid Earth</li> <li>Describe the structure of the Earth</li> <li>Explain the development of Earth's atmosphere and the influence of early life on the atmosphere</li> <li>Describe how the Earth's oceans and continents formed</li> <li>Explain the difference between rotation and revolution</li> <li>Describe three laws of planetary motion</li> <li>Describe how distance and mass affect gravitational attraction</li> <li>List the planets in order in which they orbit the sun</li> <li>Explain how distances in space can be measured</li> <li>Describe how the planets in our solar system were discovered</li> <li>Describe ways in which the inner planets and the outer planets differ</li> <li>Explain the difference between a planet's period of rotation and the period of revolution</li> <li>Describe the difference between prograde and retrograde rotation</li> <li>Describe the individual characteristics of Mercury, Venus, Earth and Mars</li> <li>Identify characteristics that make Earth suitable for life</li> <li>Explain how the gas giants are different from the terrestrial planets</li> <li>Describe the individual characteristics of Jupiter, Saturn, Uranus and Neptune</li> <li>Describe Pluto and explain why there is controversy about how it should be classified</li> </ul>	Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.		Projects Chapter/Unit Quizzes/Tests
Semester 1	Waves	MS-PS4-1 MS-PS4-2 MS-PS4-3	<ul style="list-style-type: none"> <li>Describe how waves transfer energy</li> <li>Distinguish between waves that require a medium and those that do not</li> </ul>	Holt Science & Technology: Physical Science (2007)	Relevant terminology related to waves and the properties of waves	Daily Assignments Labs/Activities/

	Ch. 20 – The Energy of Waves		<ul style="list-style-type: none"> <li>• Explain the difference between transverse and longitudinal waves</li> <li>• Identify and describe four wave properties</li> <li>• Explain how frequency and wavelength are related to wave speed</li> <li>• Describe reflection, refraction, diffraction &amp; interference</li> <li>• Compare destructive with constructive interference</li> <li>• Describe resonance, and give examples</li> </ul>	Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.		<p>Projects</p> <p>Chapter/Unit Quizzes/Tests</p>
Semester 2	<p>Heredity and Evolution</p> <p>Ch. 5 – Heredity</p> <p>Ch. 7 – The Evolution of Living Things</p> <p>Ch. 8 – The History of Life on Earth</p>	<p>MS-LS1-4</p> <p>MS-LS1-5</p> <p>MS-LS3-1</p> <p>MS-LS3-2</p> <p>MS-LS3-5</p> <p>MS-LS4-1</p> <p>MS-LS4-2</p> <p>MS-LS4-3</p> <p>MS-LS4-4</p> <p>MS-LS4-5</p> <p>MS-LS4-6</p> <p>MS-ESS1-4</p> <p>MS-ESS2-2</p> <p>MS-ESS2-3</p>	<ul style="list-style-type: none"> <li>• Explain the relationships between traits and heredity</li> <li>• Describe the experiments of Mendel</li> <li>• Compare dominant /recessive traits</li> <li>• Explain how genes and alleles are related to phenotypes and genotypes</li> <li>• Explain probability in predicting genotypes</li> <li>• Use the Punnett square</li> <li>• Explain the differences between mitosis and meiosis</li> <li>• Describe how chromosomes determine sex</li> <li>• Explain how a sex linked disorder occurs</li> <li>• Interpret a pedigree</li> <li>• Identify two kinds of evidence that show that organisms have evolved</li> <li>• Describe pathways through which a modern animal evolved from an ancient animal</li> <li>• Explain how comparing organism can provide evidence that they have a common ancestor</li> <li>• List sources of Darwin's ideas about evolution</li> <li>• Describe the four parts of Darwin's Theory of natural selection</li> <li>• Relate genetics to evolution</li> <li>• Give examples of natural selection in action</li> <li>• Outline the process of speciation</li> <li>• Explain how fossils can be formed and how their age can be estimated</li> <li>• Describe the geological time scale and the way that scientists use it</li> <li>• Compare two ways that conditions for life on Earth have changed over time</li> </ul>	<p>Holt Science &amp; Technology: Life Science (2007)</p> <p>Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.</p>	Relevant terminology related to heredity and how organisms change over time	<p>Daily Assignments</p> <p>Labs/Activities/ Projects</p> <p>Chapter/Unit Quizzes/Tests</p>

			<ul style="list-style-type: none"> <li>Outline the major developments that allowed life to exist on Earth</li> <li>Describe the types of organism that arose during the four major division of the geological time scale</li> <li>Describe two characteristics that all primates share</li> <li>Describe three major groups of hominids</li> </ul>			
Semester 1 or Semester 2	<p>Plate Tectonics &amp; Earth Over Time</p> <p>Ch. 7 – Plate Tectonics</p>	<p>MS-ESS1-4</p> <p>MS-ESS2-2</p> <p>MS-ESS2-3</p> <p>MS-ESS3-5</p>	<ul style="list-style-type: none"> <li>Identify the layers of the Earth by their chemical composition</li> <li>Identify the layers of the Earth by their physical properties</li> <li>Describe plate tectonics</li> <li>Explain how scientists know about the structure of Earth's interior</li> <li>Describe Wegener's hypothesis of continental drift</li> <li>Explain how sea-floor spreading provides a way for continents to move</li> <li>Describe how new oceanic lithosphere forms at mid-ocean ridges</li> <li>Explain how magnetic reversals provide for sea-floor spreading</li> <li>Describe the different types of tectonic plate boundaries</li> <li>Describe the forces thought to move tectonic plates</li> <li>Explain how scientists measure the rate at which tectonic plates move</li> <li>Describe how stress can deform rocks</li> <li>Describe the major types of folds</li> <li>Explain the difference between the major fault types</li> <li>Identify the most common types of mountains</li> <li>Explain the difference between uplift and subsidence</li> </ul>	<p>Holt Science &amp; Technology: Earth Science (2007)</p> <p>Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.</p>	Relevant terminology related to plate tectonics and geologic time	<p>Daily Assignments</p> <p>Labs/Activities/ Projects</p> <p>Chapter/Unit Quizzes/Tests</p>
Semester 2	<p>The Atom &amp; Interactions of Matter</p> <p>Ch. 11 - Intro. to Atoms</p>	<p>MS-PS1-1</p> <p>MS-PS1-2</p> <p>MS-PS1-3</p> <p>MS-PS1-5</p> <p>MS-PS1-6</p>	<ul style="list-style-type: none"> <li>Describe some of the experiments that led to the current atomic theory</li> <li>Compare the different models of the atom</li> <li>Explain the changes in the atomic theory as scientists make new discoveries</li> <li>Describe the size of the atom</li> </ul>	Holt Science & Technology: Physical Science (2007)	Relevant terminology related to the atom, atomic structure, and compounds including chemical	<p>Daily Assignments</p> <p>Labs/Activities/ Projects</p>

	<p>Ch. 12 - The Periodic Table  Ch. 13 - Chemical Bonding  Ch. 14 - Chemical Reactions  Ch. 15 - Chemical Compounds</p>		<ul style="list-style-type: none"> <li>• Name the parts of an atom</li> <li>• Describe the relationship between numbers of protons and neutrons and atomic number</li> <li>• State how isotopes differ</li> <li>• Calculate atomic masses</li> <li>• Describe the forces within an atom</li> <li>• Describe how Mendeleev developed the periodic table</li> <li>• Explain how elements are arranged on the modern table</li> <li>• Compare metals, nonmetals and metalloids based on their properties and location on the table</li> <li>• Describe the difference between period and group</li> <li>• Explain why elements are often groups with similar properties</li> <li>• Describe the properties of the elements in the groups of the periodic table</li> <li>• Describe chemical bonding</li> <li>• Identify the number of valence electrons in an atom</li> <li>• Predict whether an atom is likely to form bonds</li> <li>• Explain how ionic bonds form</li> <li>• Describe how positive ions form</li> <li>• Describe how negative ions form</li> <li>• Explain why ionic compounds are neutral</li> <li>• Explain how covalent bonds are formed</li> <li>• Describe molecules</li> <li>• Explain how metallic bonds form</li> <li>• Describe the properties of metals</li> <li>• Describe how chemical reactions produce new substances with different physical and chemical properties</li> <li>• Identify four signs that indicate that a chemical reaction might be taking place</li> <li>• Explain what happens to chemical bonds during a chemical reaction</li> <li>• Describe four types of chemical reactions</li> <li>• Classify a chemical equation as one of four types of reactions</li> <li>• Compare exothermic and endothermic reactions</li> <li>• Explain activation energy</li> </ul>	<p>Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.</p>	<p>bonding and chemical reactions</p>	<p>Chapter/Unit Quizzes/Tests</p>
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			<ul style="list-style-type: none"> <li>• Interpret an energy diagram</li> <li>• Describe five factors that affect the rate of a reaction</li> <li>• Describe the properties of ionic and covalent compounds</li> <li>• Classify compounds as ionic or covalent based on their properties</li> <li>• Describe properties of acids</li> <li>• Identify uses of acids</li> <li>• Describe properties of bases</li> <li>• Identify uses of bases</li> <li>• Explain the difference between strong acids and bases and weak acids and bases</li> <li>• Identify acids and bases by using the pH scale</li> <li>• Describe the formation and uses of salts</li> <li>• Explain why there are so many organic compounds</li> <li>• Identify and describe some of the different types of organic compounds.</li> </ul>			
Semester 2	<p>Electricity and Magnetism</p> <p>Ch. 17 - Intro. to Electricity</p> <p>Ch. 18 - Electromagnetism</p> <p>Ch. 19.2 - Communication Technology</p>	<p>MS-PS2-3</p> <p>MS-PS2-5</p> <p>MS-PS3-2</p>	<ul style="list-style-type: none"> <li>• Describe how charges object interact by using the law of electric charges</li> <li>• Describe different ways in which an object can become charged</li> <li>• Compare conductors with insulators</li> <li>• Give examples of static electricity and electric discharge</li> <li>• Describe electric current</li> <li>• Compare voltage and current</li> <li>• Contrast resistance and current</li> <li>• Discuss how thermocouples and photocells generate energy</li> <li>• Calculate current, voltage, &amp; resistance with Ohm's law</li> <li>• Calculate electric power</li> <li>• Measure the electrical energy used by a machine</li> <li>• Name the essential parts to a circuit</li> <li>• Compare a series &amp; parallel circuit</li> <li>• Explain how fuses and circuit breakers work</li> <li>• Describe the properties of magnets</li> <li>• Explain why some materials are magnetic and some are not</li> <li>• Describe different kinds of magnets</li> </ul>	<p>Holt Science &amp; Technology: Physical Science (2007)</p> <p>Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.</p>	<p>Relevant terminology related to electricity and magnetism</p>	<p>Daily Assignments</p> <p>Labs/Activities/ Projects</p> <p>Chapter/Unit Quizzes/Tests</p>

Semester 2	Human Body Systems  Ch. 22 - Body Organization and Structure Ch. 25 - Communication and Control	MS-LS1-3 MS-LS1-7 MS-LS1-8 MS-LS3-1 MS-LS4-3	<ul style="list-style-type: none"> <li>Describe how tissues, organs and systems are related</li> <li>Identify the major organ systems and how they work together to achieve homeostasis</li> <li>Identify the major organs of the skeletal system</li> <li>Describe the types of bones and their functions</li> <li>Distinguish between the types of joints</li> <li>Discuss injuries to the skeletal system</li> <li>List the three types of muscles and how they work</li> <li>Compare aerobic and resistance exercise</li> <li>List the functions and structure of the skin</li> <li>Describe the functions of nails and hair</li> <li>Describe injuries to the muscles and skin</li> <li>Describe the relationship between the central and peripheral nervous system</li> <li>Compare somatic and autonomic nervous system</li> <li>List the functions of the regions of the brain</li> <li>Describe how a feedback mechanism works</li> <li>Describe the five sense organs, their structures and how they work</li> <li>Explain the importance of the Endocrine system</li> <li>Identify the major endocrine glands and what hormones are produced</li> <li>Discuss hormone imbalances</li> </ul>	Holt Science & Technology: Life Science (2007)  Relevant additional/ supplemental resources including labs, research projects, videos, video clips, and internet sites.	Relevant terminology related to the organization and structure of the human body and its communication and control systems.	Daily Assignments  Labs/Activities/ Projects  Chapter/Unit Quizzes/Tests
Semester 1 Semester 2	Throughout the various units	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4	Middle School Engineering Design The middle schools engineering design practices, disciplinary core ideas and crosscutting concepts will incorporated into the various units throughout the school year	Relevant resources including textbooks, labs, research projects, problems, etc.....	Relevant terminology related to the engineering design process and its implementation	Daily Assignments  Labs/Activities/ Projects  Chapter/Unit Quizzes/Tests

*Please note that the curriculum outline/map are subject to change.  
If any changes are made, the students will be notified of those changes and the maps will be modified.*