

**Argenta-Oreana Middle School**  
**6<sup>th</sup> Grade Science**  
**Textbook: McGraw-Hill Science**

<b>Date Semester</b>	<b>IL Learning Standards</b>	<b>Unit and/or Essential Question Content and/or Skills</b>	<b>Assessments and/or Products</b>
Weeks 1 and 2	11A 11B	Introduction to new students, classroom rules and Science laboratory rules. Students are surveyed as to general Science knowledge. Discussion centers on Types of Science and “What is Science?” Students review, or learn, the Metric System and how it applies to measurement in Science. Most measurement is done in the Metric system in Science inquiry.	None
Week 3	11A 11B 12C 13A 13B	Students study buoyant force. (text pps. 14 and 15) Students then construct boats out of foil and waxed paper and compete for which vessel will hold the most mass without sinking for the longest period of time. <b>(Supplement to the curriculum)</b>	Buoyant vessel for any length of time and accurate measurement of mass used in the boat qualifies for a Passing grade (100%)
	11B 12C	Students study mass, weight, volume, density, and water displacement (text pps. 3-5). Supplementary activities are done to reinforce the concept of water displacement. (Placing objects of varying masses into measured volumes of water, then measuring the “spill.”) Students learn to make accurate measurements of solids and liquids. Students learn to record accurate data onto pre-made charts. <b>(Supplement to the curriculum)</b>	Completion of charts with measurement data graded on a percentage basis.
Week 4	11A	Students learn the steps of The Scientific Method. (Six steps are taught in 6 <sup>th</sup> grade- <b><u>Question, Hypothesis, Materials, Procedure, Record the Data, and Conclusion.</u></b> )	Written quiz graded on a percentage basis.

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	<p>11A 11B 12D 13A 13B</p>	<p>Students learn the names of and the functions of 32 pieces of lab equipment used in the 6th grade Science lab. <b>(Supplement to the curriculum)</b></p> <p>Students will learn the definition of the word “compression.” Other vocabulary words introduced to the students will be “s” waves, “p” waves, and “l” waves. The students will participate in activities with slinky springs to demonstrate the kinds of waves. Students will then build “towers” out of CD cases to demonstrate compression and structural collapse, as it pertains to the Twin Towers’ destruction on 9-11-01. <b>(Supplement to the curriculum)</b></p>	<p>Knowledge-based written exam graded on a percentage basis. Performance based assessment where student must choose a piece(s) of lab equipment based upon the function of that equipment.</p> <p>Completion of an observation data sheet will qualify each student for a Passing grade— (100%)</p>

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Week 5	12B	Students learn to classify living things into 6 Kingdoms of Life. (text pps. 151-175—Chapter 4) Included in this chapter, students will learn about the Scientific Name, and the Hierarchy of Living Things.	Criterion- based quizzes, criterion-based test, graded on a percentage basis.
Week 6	12A 12B  12A 12B 13B	Students learn about the food chain, producers, consumers, decomposers, populations, communities, and ecosystems. (text pps. 106-109).  A drop-in unit is done at this time to coincide with a field trip to the local nature preserve (Rock Springs) to allow the students to experience a forest community, a grassland community, and an aquatic community. Naturalists at the nature preserve assist students in identifying (not collecting) deciduous and conifer trees that are found in the Macon County area. ( <b>Supplement to the curriculum</b> )	Criterion-based quizzes and tests, which are graded on a percentage basis.  none
Weeks 7 and 8	12B  12A 12B	Students are assigned to collect, identify, and preserve a 10-leaf collection of deciduous and conifer leaves in the Macon County area. ( <b>Supplement to the curriculum</b> )  Students will begin lessons about structures found inside plant and animal cells. They also learn about the functions of each of	Finished product will be a mounted collection of leaves, graded according to a rubric based upon points.  Colored and labeled drawings of each type of

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	12A	<p>those structures. Students learn about the similarities and differences between plant and animal cells. (text pps. 112-119) Students also learn the organization of living things, from cells to organ systems. (text pps. 97-105)</p> <p>Students will construct plant and animal cells out of modeling clay, mount the cell on sturdy cardstock, and label each structure with their own color key. <b>(Supplement to curriculum)</b></p>	<p>cell are assessed for accuracy, based on a percentage grade. Pencil and paper written quizzes graded on a percentage basis.</p> <p>Assessment is according to a rubric.</p>
Week 9	11A 12A 12C  12D	<p>Students learn about the process of photosynthesis. An experiment is done to determine the components of chlorophyll by using the process of <b>chromatography</b>. <b>(Supplement to curriculum)</b></p> <p>Students learn about how nutrients and waste products travel inside and outside the cell. They learn about the processes of diffusion, osmosis, equilibrium, transpiration, cellular respiration, active and passive transport, and permeability. (text pps. 126-133).            Students perform an experiment on the permeability of various, measure and record data pertaining to each material's permeability. <b>(Supplement to the curriculum)</b></p>	<p>Notes taken in spiral; a finished chromatography strip with observations recorded on a data sheet qualify the student for a passing grade—(100%)</p> <p>Criterion-based worksheets</p> <p>Experiment assessed on a completed data chart, with a written conclusion.</p>

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		Students begin to learn about the care and use of the compound microscope. <b>(Supplement to the curriculum)</b>	Performance-based exam graded by a rubric.
Week 10	11A 13A	<p>Students will learn about the 12 main parts of a compound microscope. Students will use actual microscopes as they identify the name and function of each part. <b>(Supplement to the curriculum)</b></p> <p>Students will learn the procedure to set-up a “wet-mount” slide for specimen observation and identification. Students will use cotton fibers and food coloring to set-up a slide, then find the specimen under the lens of the compound microscope. <b>(Supplement to the curriculum)</b></p>	<p>Performance-based assessment—not for a grade. Used as a learning tool.</p> <p>Accurate drawing and coloring of the specimen on a data chart.</p>
Week 10 (continued)	12A 12B 13B	<p>Students learn the identifying characteristics of other members of the Kingdoms of Life. This includes Protists, Fungi, Archaeobacteria, and Eubacteria. They learn examples of the members of each Kingdom. (text pps. 164-174). Students also learn the identifying characteristics, origins of, treatments, and eradication of viruses. (text p. 174)</p>	Criterion-based worksheets
Week 11		Students will view actual bread mold samples by setting-up their own wet-mount slides and viewing the specimens under low power, mid-power, and high power lenses of the compound	Observation data sheets with written data and accurate drawings of their

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Week 12	12A 12B	<p>microscope. (<b>Supplement to the curriculum</b>)            Students will learn about the various methods of reproduction of microbes. (text pps. 178-180)</p> <p>Students will learn the life cycles of certain plants and animals, with particular attention being paid to the life cycle of animals (text pps. 182-187.)</p>	<p>specimens.            Criterion-based written test.</p> <p>Pencil and paper criterion-based worksheets, quizzes, and tests.</p>
Week 13	12B	<p>Students will also begin the study of cellular reproduction as it pertains to <b>mitosis</b> (text pps. 138-143.)</p> <p>Students will learn about cellular reproduction as it pertains to <b>meiosis</b> (text pps 144 and 145.)            Students will begin the study of the Endocrine system and the function of hormones within the human body (text pps. 592-601.)</p>	<p>Criterion-based worksheets and a quiz.</p> <p>Criterion-based worksheets and quiz.            Performance based worksheet to place endocrine system organs in the correct place within the body.</p>
Weeks 14 and 15	12A 13B	<p>Students will learn about chromosomes, genes, and DNA. They will learn about the enzymes that make up the DNA double helix (text pps. 510-523)</p>	<p>Hands-on construction of a DNA molecule assessed by a rubric.            Other assessment done by teacher-made criterion based test.</p>

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Week 16	13B	Students will learn about heredity and hereditary traits, blood types, and inherited diseases (text pps.524-539)	No assessment. Students will use mock blood for actual tests on blood typing. <b>(Supplement to the curriculum.)</b>
Week 17	12C	Introduction to Physical Science-Chemistry. Notes and diagrams will be distributed to students describing Parts of the Atom. Notes will be given on the nucleus of the atom: proton and neutron. Notes and diagrams will follow on the parts of a neutron: the quarks and gluons. Notes and diagrams will follow on the electron and its importance to the make-up and function of the atom. Discussion will also center on the importance of each atomic particle. (text pps. 18-31). Reference will be given to electron configurations, but detailed instruction will be given at a later date.	Labeled diagrams.
Week 18	12C	Study of Elements and Atoms with specific study of the Periodic Table of Elements (text pps. 26-29). Students will memorize the names, atomic numbers, element symbols, and SOM for 25 of the most common elements listed on the Periodic Table. Students will also be assigned to do an expository research paper on an element.	Assessment done by written exam. Research paper is assessed by a pre-established rubric.

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		<p>Students will also learn about the physical properties of matter. They will review applicable vocabulary including, matter, mass, volume, density, gravity, and weight. New concepts and terminology will be introduced concerning mixtures and compounds.(text pps. 2-10). Students will experiment with various substances such as Kool-Aid, iced tea, Milk of Magnesia, shaving cream, and metal alloys for classification into the sub-groups of solutions, suspension, emulsions, colloids, and alloys.</p> <p>Students will review 4 states of matter. A hands-on experiment will be done making a mystery substance called “ooblek” to demonstrate states of matter changes. <b>(supplement to the curriculum)</b></p>	<p>Written exam and a practical assessment will be done by having students identify actual substances.</p>
Week 19	12C 13A 13B	<p>Students will learn about the chemical properties of matter. They will learn the 4 Key Signs of a Chemical Change (text pps. 12 and 13).</p> <p>A hands-on experiment will be done to demonstrate SOM (state of matter) change by heating sugar to its melting point. <b>(supplement to the curriculum)</b></p> <p>Students will learn of the many properties of water (adhesion and cohesion). They will perform a hands-on experiment about capillary action called “Rope Races”. <b>(supplement to the curriculum)</b></p>	<p>Assessment by written test.</p> <p>Assessment done by completion of the experiment and recording the data on a data chart.</p>
Week 20	12C 13A 13B	<p>Continuation of study of chemical changes (text pps. 32-41). A hands-on experiment concerning the oxidation of copper will be done.</p> <p>Students will study acids and bases as it regards to pH of</p>	<p>Assessment done by the completion of the experiment and recording the data on a data chart.</p>

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		<p>substances (text pps. 42-47). Students will experience the use of indicators, such as litmus paper. A hands-on experiment will be done by boiling cabbage juice to make a plant indicator for acids and bases. (<b>supplement to the curriculum</b>)</p> <p>Students will be given several mystery substances to determine the pH, using litmus papers.</p>	Performance based exam
Week 21	11A 11B 12C	Densities of solids and liquids. (Chapter 1) Students experiment with various liquids to determine the density of each liquid. The density formula of $D=m/v$ will be used.	Experiment with data chart. Pencil/paper exam.
Weeks 22 and 23		<p>Students will learn the chemical formula for 20 to 25 common molecules. A 3-dimensional model will be made for one of the molecules, as the student chooses. (<b>supplement to the curriculum</b>)</p> <p>Students will learn of covalent bonds, ionic bonds, 4 types of chemical reactions, and endothermic and exothermic reactions (text pps. 36-44).</p>	Diagram drawing, pencil paper exam, and complete model with labels.  Pencil/paper exam
Week 24		Students will review the orbits around the nucleus of an atom. They will learn of basic electron configurations for simple atoms. Each student will complete a diagram of an electron configuration.	Diagram
Weeks 25, 26, and 27	12D	Study of kinetic and potential energy. (text unit #2). Topics covered include average kinetic energy, conduction and	Pencil/paper exams.

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Week 28	11A 11B 12C 12D 12F 13B	convection, electromagnetic spectrum, insulators, and the layers of the Earth's atmosphere.  DROP-IN UNIT on Meteorology. Students will learn meteorological terminology, symbols, and mapping techniques.	Given real-time data, students will map the data on a US map, then make predictions about the weather in a given area.
Week 29	12C 12D	Students study the Gas Laws ( Boyle's Law and Charles' Law) with demonstrations using bicycle pump, bicycle tires, and balloons. (text pps. 64-73)	Illustrations to be labeled. Pencil/paper exams and short answer to posed problems.
Week 30	12C 12D	Study of the internal combustion engine. Study of the Kelvin scale for measurement of sub-zero temperatures.	No formal assessment
Weeks 31 and 32	13B	Alternate Energy sources. (text pps. 80-96). Students will focus specifically on nuclear energy and nuclear power plants, hydroelectricity, wind power, solar power, and biomass conversion.	Pencil/paper exam. Students will be given a problem concerning Hydrogen reclamation and asked to write about a possible solution.

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Week 33	12D	Study of Forces. Topics covered are motion, speed, acceleration, and velocity. The formula for speed will be used ( $S=d/t$ ) as students race 1:64 die cast model cars down ramps at various slopes. (text pps194-205)	Completed data chart with accurate computation of speed
Weeks 34, 35, and 36	12D	Study of Newton's 3 Laws of Motion. (text pps. 208-239) Topics covered are inertia, forces, The Law of Conservation of Energy, momentum, center of gravity, and weightlessness. Many experiments and activities will be used to demonstrate the scientific principles. ( <b><i>supplement to the curriculum</i></b> )	Paper/pencil exam. Airplane contest. Balloon race for speed and distance. Accurate data sheets for above listed experiments.
Weeks 37 and 38.	11A 11B 12C 12D 12E 13A 13B	DROP-IN UNIT on Volcanoes. Topics covered are plate tectonics, Pangea, earthquakes, tsunamis, 3 main types of volcanoes, their structures, and how a volcanic eruption occurs. ( <b><i>supplement to the curriculum</i></b> ) (text pps 386-424)	Worksheets with detailed diagrams, pencil/paper exam, Final project of a 3-dimensional, working volcano (using the classic acid + base= a salt reaction). Assessment is done using a pre-made rubric for scoring.

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