Middletown Scope and Sequence

Subject Area: **Science** **Quarter :** **2** **Grade:** **8**

Standards Key Ideas/Major Understandings/Performance Indicators/Competencies	Plan #	Resources (Print, Visual, Technology, Manipulatives)	Assessment (Evidence and Scoring Guides)
MST4.PS3.1 Students observe and describe properties of materials, such as density, conductivity, and solubility. **(3.1b,c)**	3-4 days	Ch. 2.2 pg 45-51	Section Assessment pg 51 Various labs/tests on solubility
3.1b Solubility can be affected by the nature of the solute and solvent, temperature, and pressure. The rate of solution can be affected by the size of the particles, stirring, temperature, and the amount of solute already dissolved.		Ch 8.1,8.2 pg 228-237	Section Assessment pg. 234 Section assessment pg 239
3.1c The motion of particles helps to explain the phases (states) of matter as well as changes from one phase to another. The phase in which matter exists depends on the attractive forces among its particles.		Ch 3.1 pg 68-74	Section assessment pg. 74
MST.4.I.PS3.2 Students distinguish between chemical and physical changes. **(3.2a-e)**	5-7 days	Ch. 2.2 and2.3	Section Assessment p58 Concept Map pg 62 Various labs/tests on chemical and physical changes
3.2a During a physical change a substance keeps its chemical composition and properties. Examples of physical changes include freezing, melting, condensation, boiling, evaporation, tearing, and crushing.		Ch. 3.3	Section Assessment pg 91
3.2b Mixtures are physical combinations of materials and can be separated by physical means.		Ch 2.1	Section Assessment pg 44
3.2c During a chemical change, substances react in characteristic ways to form new substances with different physical and chemical properties. Examples of chemical changes include burning of wood, cooking of an egg, rusting of iron, and souring of milk.		Ch 2.3	Section Assessment pg 58

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3.2d Substances are often placed in categories if they react in similar ways. Examples include metals, nonmetals, and noble gases.		Ch. 5.2-5.3	Section Assessment pg 138 and 145
3.2e The Law of Conservation of Mass states that during an ordinary chemical reaction matter cannot be created or destroyed. In chemical reactions, the total mass of the reactants equals the total mass of the products.		Ch. 7.1	Section Assessment pg 198
MST.4.I.PS3.3 Students develop mental models to explain common chemical reactions and changes in states of matter. (**3.3a-g**)	6-8 days		Various labs/tests on atomic structure and periodic table
3.3a All matter is made up of atoms. Atoms are far too small to see with a light microscope.		Cha. 4.1 and 4.2 http://web.utah.edu/unews/releases/03/jun/orbitals.html photographs of atoms, high resolution. Something that may be electron orbitals. http://www.harcourtschool.com/activity/states_of_matter/ animation of particles in solids, liquids, and gases	Section Assessment pg 105 and 112
3.3b Atoms and molecules are perpetually in motion. The greater the temperature, the greater the motion.		Ch 16.1	Section Assessment pg 478
3.3c Atoms may join together in well defined molecules or may be arranged in regular geometric patterns.		Ch. 6.1	Section Assessment pg 164
3.3d Interactions among atoms and/or molecules result in chemical reactions.		Ch 2.3	Section Assessment pg 58
3.3e The atoms of any one element are different from the atoms of other elements.		Ch 5.2. 5.3	Section Assessment pg 138 and 145
3.3f There are more than 100 elements. Elements combine in a multitude of ways to produce compounds that account for all living and nonliving substances. Few elements are found in their pure form.		Ch 6.3	Section Assessment pg 175

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3.3g The periodic table is one useful model for classifying elements. The periodic table can be used to predict properties of elements (metals, nonmetals, noble gases).		Cha. 5.2 and 5.3 http://www.factmonster.com/periodictable.php interactive Periodic Table	Section Assessment pg 138 and 145
MST.4.PS4.1 Students describe the sources and identify the transformations of energy observed in everyday life. **(4.1a-e)**	5-7 days	Ch 15.1- 15.3	Section Assessment pgs 452, 459 and 466 Various labs/tests on energy and its transformations.

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Standards Key Ideas/Major Understandings/Performance Indicators/Competencies	Plan #	Resources (Print, Visual, Technology, Manipulatives)	Assessment (Evidence and Scoring Guides)
4.1a The Sun is a major source of energy for Earth. Other sources of energy include nuclear and geothermal energy.		**Cha. 15.1 and 15.3** http://www.physics.mun.ca/~jjerrett/energy/energyfreefall.html animation and graph, KE and PE changes during free fall http://www.eia.doe.gov/kids/energyfacts/science/formsofenergy.html tutorial on energy in its various forms http://www.epa.gov/globalwarming/kids/gw.html tutorial on global warming http://www.epa.gov/globalwarming/kids/version2.html tutorial on global warming http://www.wvic.com/how-gen-works.htm animation of generator. Includes photographs of generators of hydroelectric plants. http://techalive.mtu.edu/meec/module19/Page4.htm visual of where the energy in fossil fuels comes from http://www.fotosearch.com/STK021/pgb1626/ photograph of coal burning power plant, Turkey http://www.energyquest.ca.gov/story/chapter06.html photographs of turbines of hydroelectric plants http://www.tva.gov/power/coalart.htm diagram of coal burning power plant	Section Assessment pgs 452, 459 and 466
4.1b Fossil fuels contain stored solar energy and are considered nonrenewable resources. They are a major source of energy in the United States. Solar energy, wind, moving water, and biomass are some examples of renewable energy resources.		Ch 15.3	Section Assessment pg 466

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4.1c Most activities in everyday life involve one form of energy being transformed into another. For example, the chemical energy in gasoline is transformed into mechanical energy in an automobile engine. Energy, in the form of heat, is almost always one of the products of energy transformations.		**Cha. 15.2** http://www.physics.mun.ca/~jjerrett/energy/energyfreefall.html animation and graph, KE and PE changes during free fall http://www.eia.doe.gov/kids/energyfacts/science/formsofenergy.html tutorial on energy in its various forms http://www.epa.gov/globalwarming/kids/gw.html tutorial on global warming http://www.epa.gov/globalwarming/kids/version2.html tutorial on global warming http://www.wvic.com/how-gen-works.htm animation of generator. Includes photographs of generators of hydroelectric plants. http://techalive.mtu.edu/meec/module19/Page4.htm visual of where the energy in fossil fuels comes from http://www.fotosearch.com/STK021/pgb1626/ photograph of coal burning power plant, Turkey http://www.energyquest.ca.gov/story/chapter06.html photographs of turbines of hydroelectric plants http://www.tva.gov/power/coalart.htm diagram of coal burning power plant	Section Assessment pg 459
4.1d Different forms of energy include heat, light, electrical, mechanical, sound, nuclear, and chemical. Energy is transformed in many ways.		Ch 15.1	Section Assessment pg 452
4.1e Energy can be considered to be either kinetic energy, which is the energy of motion, or potential energy, which depends on relative position.		Ch 15.1	Section Assessment pg 452
MST.4.PS4.2 Students observe and describe heating and cooling events. **(4.2a-e)**	3-4 days	Ch 16.1 and 16.2	Section Assessment pg 478 and 483 Various labs/tests

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			on heat and its properties
4.2a Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature.		Ch. 16.1	Section Assessment pg 478
4.2b Heat can be transferred through matter by the collisions of atoms and/or molecules (conduction) or through space (radiation). In a liquid or gas, currents will facilitate the transfer of heat (convection).		Ch 16.2	Section Assessment pg 483
4. 2c During a phase change, heat energy is absorbed or released. Energy is absorbed when a solid changes to a liquid and when a liquid changes to a gas. Energy is released when a gas changes to a liquid and when a liquid changes to a solid.		Ch. 16.1	Section Assessment pg 478
4. 2d Most substances expand when heated and contract when cooled. Water is an exception, expanding when changing to ice.		Ch. 16.1 and 3.3	Section Assessment pg 478 and pg 91
4.2e Temperature affects the solubility of some substances in water.		Ch. 8.2	Section Assessment pg 239
MST4.I.PS4.4 Students observe and describe the properties of sound, light, magnetism, and electricity. **(4.4a-c)**	4-5 days	Ch. 18.1-18.3	Section Assessment pg 538, 545, and 549 Various labs on labs/tests light
4.4a Different forms of electromagnetic energy have different wavelengths. Some examples of electromagnetic energy are microwaves, infrared light, visible light, ultraviolet light, X-rays, and gamma rays.		Cha. 18.2 http://www.colorado.edu/physics/2000/waves_particles/wavpart4.html tutorial and animation, electromagnetic radiaion http://www.astro.uiuc.edu/projects/data/Doppler/index.html animation of doppler effect with light http://www.physics.mun.ca/~jjerrett/doppler/doppler.html animation of doppler effect with sound	Section Assessment pg 545

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4.4b Light passes through some materials, sometimes refracting in the process. Materials absorb and reflect light, and may transmit light. To see an object, light from that object, emitted by or reflected from it, must enter the eye.		Ch 18.3	Section Assessment pg 549
4.4c Vibrations in materials set up wave-like disturbances that spread away from the source. Sound waves are an example. Vibrational waves move at different speeds in different materials. Sound cannot travel in a vacuum.		Ch. 17.1 and 17.4	Section Assessment pg 503 and 521
MST4.I.PS4.5 Students describe situations that support the principle of conservation of energy. **(4.5a,b)**		Ch. 15.2	Section Assessment pg 459 Various labstests on energy
4.5a Energy cannot be created or destroyed, but only changes from one form into another.	2-3 days	Ch 15.2	Section Assessment pg 459
4.5b Energy can change from one form to another, although in this process some energy is always converted to heat. Some systems transform energy with less loss of heat than others.		Ch 15.2	Section Assessment pg 459