

MOHONASEN CENTRAL SCHOOL DISTRICT Curriculum Map for 6th Grade Science

TEXTBOOK: Holt Science and Technology Earth Science

MON TH	UNITS	STANDARDS	CHAPTER S	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
September	Scientific Method, Measurement, and Safety	MST 1 Standard 1: analysis inquiry and design. Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions. Standard 4: Process skills: 1: follow safety procedures in the classroom and laboratory. 2, and 3. Physical Setting Skill 6: Measure the angular elevation of an object using appropriate instruments. 10: Determine the density of liquids, and regular and irregular shaped solids. 11: Determine the volume of a regular and irregular shaped solid, using water displacement.	1	<i>Key Idea 1: The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process</i> Key idea 3: S3.1, S3.2, S3.3	S1.1 Formulate questions independently with the aid of references appropriate for guiding the search for explanations of everyday observations. S1.1a formulate questions about natural phenomena S1.1b identify appropriate references to investigate a question S1.1c refine and clarify questions so that they are subject to scientific investigation S1.2 Construct explanations independently for natural phenomena, especially by proposing preliminary visual models of phenomena. S3.2d formulate and defend explanations and conclusions as they relate to scientific phenomena S3.2e form and defend a logical argument about cause-and-effect relationships in an investigation S3.2f make predictions based on experimental data S3.2g suggest improvements and recommendations for further studying S3.2h use and interpret graphs and data tables S3.3 Modify their personal understanding of phenomena based on evaluation of their hypothesis.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES	LAB THEMES	ASSESSMENTS	
	S1.1 Formulate questions independently with the aid of references appropriate for guiding the search for explanations of everyday observations. S1.1a formulate questions about natural phenomena S1.1b identify appropriate references to investigate a question S1.1c refine and clarify questions so that they are subject to scientific investigation S1.2 Construct explanations independently for natural phenomena, especially by proposing preliminary visual models of phenomena. S3.2d formulate and defend explanations and conclusions as they relate to scientific phenomena S3.2e form and defend a logical argument about cause-and-effect relationships in an investigation S3.2f make predictions based on experimental data S3.2g suggest improvements and recommendations for further studying S3.2h use and interpret graphs and data tables S3.3 Modify their personal understanding of phenomena based on evaluation of their hypothesis.	<ul style="list-style-type: none"> • Teacher's workshop video, "Scientific method" • Journal writing • Student/ teacher demonstrations • Science news • Cooperative learning • Hands -on lab activities • Use of the 6th Grade Earth Science Reference Table • Use of the Solar Arc Model 	Using Scientific Method Developing data tables Graphing Making observations Developing hypotheses Refining scientific questions Experimentation and drawing conclusions Measurement (SI system): Using a metric ruler Determining volume using a graduated cylinder Measuring temperature using a thermometer Calculating mass using a metric balance Determining density of regular and irregular objects Creating an astrolabe to measuring the altitude of an object. Safety in science	Note: there will be quizzes, homework assignments, labs, and tests for each unit. <ul style="list-style-type: none"> • M&M Lab • Summative assessment – Balloon Lab; Design your own experiment. • Lab practical (calculating length, volume, mass, temperature, density, and altitude). • Balloon Lab • Bubblegum Lab • Plant Lab – control/variable • Temperature Lab – prediction testing (using thermometer) • Exercise Lab – control/variable • Bouncing Ball Lab • Ancient Puzzle/scientific method practice. • First Day of Fall (solar arc lab 1). 	

MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
October	Maps,	Standard 4 Physical Setting Skills 1. Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a location on a map. 5. Use a magnetic compass to find cardinal directions. 7. Generate and interpret field maps including topographic and weather maps.	Chapter 2	See Physical Setting Skills	See Physical Setting Skills
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	See Physical Setting Skills	<ul style="list-style-type: none"> • CD-Rom Topographic Maps • Student presentations • Interpreting regional topographic maps • CD-Rom TOPO • Field Trip To John Boyd Thacher State Park to build onto future lessons. 		<ul style="list-style-type: none"> • Building a magnetic compass • Locate cardinal directions • Using an orienteering compass to navigate. • Interpreting topographic maps • Calculating gradient 	<ul style="list-style-type: none"> • Group presentations/teaching (topographic map interpreting). • Student generated quizzes • Outdoor compass use • Creating a topographic map lab

MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
November December	Minerals of Earth's Crust Rocks and The Rock Cycle	Standard 4 The Physical Setting. Physical Setting Skills 2 using identification tests and a flow chart, identify mineral samples.	3, 4, and 6	2 <i>Many of the phenomena that we observe on earth involve interactions among components of air, water, and land.</i>	2.1 <i>Explain how the atmosphere (air), hydrosphere (water), and lithosphere (land) interact, evolve, and change.</i> 2.2 <i>Describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.</i>
	MAJOR UNDERSTANDING	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	2.1c: The rock at Earth's surface forms a nearly continuous shell around Earth called the lithosphere. 2.2g Rocks are classified according to their method of formation. 2.2h The rock cycle model shows how types of rock or rock material may be trans- formed from one type of rock to another. 2.1e Rocks are composed of minerals. 2.1g The dynamic processes that wear away Earth's surface include weathering and erosion. 2.1f: Fossils are usually found in sedimentary rocks. Fossils can be used to study past climates and environments. 2.1h The process of weathering breaks down rocks to form sediment. Soil consists of sediment, organic material, water, and air. 2.1i Erosion is the transport of sediment. Gravity is the driving force behind erosion. Gravity can act directly or through agents such as moving water, wind, and glaciers.	Teacher and student demonstrations Hands-on laboratory studies Interconnectedness to Thacher Park Field Trip Continued use with Solar Arc Throughout the Year	<ul style="list-style-type: none"> Mineral Identification techniques/ procedure Rock Identification (sedimentary, metamorphic, and igneous). Using Earth Science Reference Tables (mineral key and rock cycle diagram). Rock Cycle Game Fossil Making Geologic Change (weathering, erosion, geologic time) 	Mineral Comparison Project "My Life as a Rock" Using diagrams Mineral Identification Lab Rock cycle simulation lab Mineral Resources of New York State Rock identification lab Rock Cycle Story Mineral identification (physical and chemical properties) Rock identification (type, texture, environment of formation).	

MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
January February	Plate Tectonics	Standard 4 Physical Setting Skill 4: plot the location of recent earthquake and volcanic activity on a map and identify patterns of distribution.	7, 8, and 9	Key idea 2 Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.	Performance Indicator 2.2: Describe volcano and earthquake patterns, the rock cycle, and climatic changes.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES		LAB THEMES	ASSESSMENTS
	<p>Major Understandings:</p> <p>2.2a: The interior of the Earth is hot. Heat flow and movement of material within Earth cause sections of Earth's crust to move. This may result in earthquakes, volcanic eruption, and the creation of mountains and ocean basins.</p> <p>2.2c: Analysis of earthquake wave data (vibrational disturbances) leads to the conclusion that there are layers within Earth. These layers- the crust, mantle, outer core, and inner core- have distinct properties.</p> <p>2.2c: folded, tilted, faulted, and displaced rock layers suggest past crustal movement.</p> <p>2.2d: Continents fitting together like puzzle parts and fossil correlation provide initial evidence that continents were once together.</p> <p>2.2e: The Theory of Plate Tectonics explains how the "solid" lithosphere consists of a series of plates that "float" on the partially molten section of the mantle. Convection cells within the mantle may be the driving force for the movement of the plates.</p> <p>2.2f: Plates may collide, move apart, or slide past one another. Most volcanic activity and mountain building occur at the boundaries of these plates, often resulting in earthquakes.</p>	<p>Use of Earth Science Reference Table</p> <p>Use of models to demonstrate scientific principals</p> <p>Use of probes and a working seismograph Science news</p> <p>Teacher/ student demonstrations Videos</p>	<ul style="list-style-type: none"> • Understanding the interior of the Earth (various layers and physical properties). • Building 3-D plate Boundary Models • Using a seismograph • Triangulating the epicenter of an earthquake • Plotting recent earthquake epicenters using latitude and longitude • Volcano Lab • Rescue near the center of the Earth • Mountain Building Lab • Convection Cell Lab 	<p>Midterm Exam (September-December)</p> <p>Proper use and interpretation of tectonic boundary maps.</p> <p>Use in using latitude and longitude to locate the epicenter of an earthquake.</p> <p>Use of P and S wave data to triangulate the epicenter of an earthquake.</p> <p>Demonstrate the types of relative plate movement and state features/ phenomena that may occur at or near each type.</p> <p>Knowledge of volcanic and earthquake hazards and emergency plans</p>	

MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
	Astronomy, Climate, and Seasons	Standard 4 Physical Setting Skill 6: Measure the angular elevation, using appropriate instruments	Chapters 17, 18 – 22 Note: some chapters may be covered in greater detail than others.	<i>1 The Earth and celestial phenomena can be described by principles of relative motion and perspective.</i>	<i>1.1 Explain daily, monthly, and seasonal changes on Earth.</i> <i>2.2: Describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.</i>
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES	LAB THEMES	ASSESSMENTS	
March April	<p>1.1a Earth's Sun is an average-sized star. The Sun is more than a million times greater in volume than Earth.</p> <p>1.1b Other stars are like the Sun but are so far away that they look like points of light. Distances between stars are vast compared to distances within our solar system.</p> <p>1.1c The Sun and the planets that revolve around it are the major bodies in the solar system. Other members include comets, moons, and asteroids. Earth's orbit is nearly circular.</p> <p>1.1d Gravity is the force that keeps planets in orbit around the Sun and the Moon in orbit around the Earth.</p> <p>1.1e Most objects in the solar system have a regular and predictable motion. These motions explain such phenomena as a day, a year, phases of the Moon, eclipses, tides, meteor showers, and comets.</p> <p>1.1f The latitude/longitude coordinate system and our system of time are based on celestial observations.</p> <p>1.1g Moons are seen by reflected light. Our Moon orbits Earth, while Earth orbits the Sun. The Moon phases as observed from Earth are the result of seeing different portions of the lighted area of the Moon's surface. The phases repeat in a cyclic pattern in about one month.</p> <p>1.1h The apparent motions of the Sun, Moon, planets, and stars across the sky can be explained by Earth's rotation and revolution. Earth's rotation causes the length of one day to be approximately 24 hours. This rotation also causes the Sun and Moon to appear to rise along the eastern horizon and to set along the western horizon. Earth's revolution around the Sun defines the length of the year as 364 ¼ days.</p> <p>1.1i The tilt of Earth's axis of rotation and the revolution of Earth around the Sun cause seasons on Earth. The length of daylight varies depending on latitude and season.</p> <p>1.1j The shape of Earth, the other planets, and stars are nearly spherical.</p> <p>2.2j Climate is the characteristic weather that prevails from season to season and year to year.</p>	<p>Use of Solar Arc Model</p> <p>Astronomy related software (virtual Moon Atlas).</p> <p>Astronomy Club Meetings</p> <p>Teacher and student demonstrations</p> <p>Use of models</p> <p>Journaling</p> <p>Video: Hyperspace</p> <p>CD-Rom - HST Interactive w/ Moon phases</p> <p>MHS LGI room (global warming debate)</p>	<p>Solar Arc Lab (continued)</p> <p>Seasonal change (angle and duration of insulation).</p> <p>The Birth, Life, and Death of Stars</p> <p>Building Astrolabes</p> <p>Calculating latitude using Polaris</p> <p>Phases of the Moon</p> <p>Solar and lunar eclipses</p> <p>Flame tests to demonstrate electromagnetic spectrum</p> <p>Global Warming Debate</p>	<p>Stellar evolution Report/ Project</p> <p>Proper use and understanding of astrolabe</p> <p>Understanding seasonal change on Earth (causes)</p> <p>Flame test lab</p> <p>Astrolabe lab</p> <p>Journal entries</p> <p>Modeling the earth's orbit</p> <p>Global warming debate (student presentations and summary).</p>	

MONTH	UNITS	STANDARDS	CHAPTERS	KEY IDEAS/CONCEPTS	PERFORMANCE INDICATORS/SKILLS
May June	Weather	Standard 4 Physical Setting Skill 7: generate and interpret field maps including topographic and weather maps. 8: predict the characteristics of an air mass based on the origin of the air mass 9: measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.	15, 16, and 17	2 <i>Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land</i>	2.1 Explain how the atmosphere (air), hydrosphere (water), and lithosphere (land) interact, evolve, and change. 2.2 Describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.
	MAJOR UNDERSTANDINGS	SUPPLEMENTAL CONTENT & LEARNING STRATEGIES	LAB THEMES	ASSESSMENTS	
	2.1j: Water circulates through the atmosphere, lithosphere, and hydrosphere in what is known as the water cycle. 2.2i Weather describes the conditions of the atmosphere at a given location for a short period of time. 2.2j Climate is the characteristic weather that prevails from season to season and year to year. 2.2k The uneven heating of Earth's surface is the cause of weather. 2.2l Air masses form when air remains nearly stationary over a large section of Earth's surface and takes on the conditions of temperature and humidity from that location. Weather conditions at a location are determined primarily by temperature, humidity, and pressure of air masses over that location. 2.2m Most local weather condition changes are caused by movement of air masses. 2.2n The movement of air masses is determined by prevailing winds and upper air currents. 2.2o Fronts are boundaries between air masses. Precipitation is likely to occur at these boundaries. 2.2p High-pressure systems generally bring fair weather. Low-pressure systems usually bring cloudy, unstable conditions. The general movement of highs and lows is from west to east across the United States.	Video Documentary: Introduction to meteorology video Web-based weather station data (Pinewood) Weather.com and related internet sites Mohonasen Web page weather resources Continued use of Solar Arc Model	<ul style="list-style-type: none"> The water cycle Making a cloud Lab Atmospheric pressure Interpreting weather maps and predicting weather patterns Measuring relative humidity and calculating dew point Hurricane in a bottle Plotting/ tracking recent hurricanes 	<p>Knowledge of the water cycle</p> <p>Predicting weather using real-time weather maps/ data.</p> <p>Understanding fronts and pressure systems</p> <p>Weather journal</p> <p>Use of sling psychrometer to determine dew point and relative humidity</p> <p>Final Exam</p>	