

Calendar-Based Curriculum Map:

7th Grade Science

	August/September	October	November
Essential Question	<p>(Introduced and carried out throughout the entire year.)</p> <p>How can science understanding developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking?</p> <p>How can the nature of technology advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs?</p> <p>How can Science and technology affect society?</p> <p>How is science and technology affected by society?</p>	<p>How can science understanding be applied to develop the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking?</p> <p>How can you explain and describe the regular and predictable motions of objects in the universe as the result of gravitational forces?</p>	<p>What are the observable properties and structure of the universe?</p>
Content	<ul style="list-style-type: none"> • Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation • Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings) • Evidence is used to formulate explanations. 	<ul style="list-style-type: none"> • Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations • Evidence is used to formulate explanations • The nature of science relies upon communication of results and justification of explanations • The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns 	<ul style="list-style-type: none"> • Most of the information we know about the universe comes from the electromagnetic spectrum • Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces

	<ul style="list-style-type: none"> • Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings) • The nature of science relies upon communication of results and justification of explanations • Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all • Advances in technology often result in improved data collection and an increase in scientific information • Technological solutions to problems often have drawbacks as well as benefits. • People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations • Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity. • Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction progress of science and technology 	<ul style="list-style-type: none"> • The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns. 	
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<p style="text-align: center;">Skills</p>	<ul style="list-style-type: none"> • Formulate testable questions and hypotheses. • Recognize the importance of the independent variable, dependent variable, control of constants, and multiple trials to the design of the valid experiment. • Design and conduct a valid experiment.. • Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment. • Recognize that different kinds of questions suggest different kinds of scientific investigation(e.g., some involve observing and describing objects organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models). • Acknowledge there is no fixed procedure called “the scientific method”, but some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other explanations • Make qualitative observations using the five senses. • Determine the appropriate tools and techniques to collect data. • Use a variety of tools and equipment to gather data (e.g. 	<ul style="list-style-type: none"> • Make qualitative observations using the five senses. • Judge whether measurements and computations of quantities are reasonable. • Use quantitative and qualitative data as support for reasonable explanations (conclusions) • Use Data as support for observed patterns and relationships, add to make predictions to be tested • Recognize the possible effects of errors in observations, measurements and calculations on the formulation of explanations (conclusions) • Evaluate the reasonableness of an explanation (conclusion) • Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories) • Communicate the procedures and results of investigations and explanations through: oral presentations, drawings and maps, data tables graphs and writings • Relate the apparent east-to west changes in the position of the Sun, other stars, and planets in the sky over the course of a day to Earth’s counterclockwise rotation about its axis. • Describe the pattern that can be observed in the changes in the number of hours of 	<ul style="list-style-type: none"> • Recognize stars are separated from one another by vast and different distances, which causes stars to appear smaller than the sun • Compare the distance light travels from the sun to Earth to the distance light travels from other stars to Earth using light years. • Describe how the Earth’s gravity pulls nay object on or near Earth toward it. • Describe how the planets gravitational pull keeps satellites and moons in orbit around them • Describe how the Sun’s gravitational pull holds the Earth and other planets in their orbits.
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	<p>microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches).</p> <ul style="list-style-type: none"> • Measure length to the nearest millimeter, mass to the nearest gram volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second. • Compare amounts/measurements • Judge whether measurements and computations of quantities are reasonable. • Calculate the range and average/mean of a set of data. • Use quantitative and qualitative data as support for reasonable explanations (conclusions) • Use data as support for observed patterns and relationships, and to make predictions to be tested. • Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions) • Evaluate the reasonableness of an explanation • Analyze whether evidence (data) and scientific principles support proposed explanations (hypothesis, laws, theories) • Communicate the procedures and results of investigations and explanations through: oral presentations, drawings and 	<p>visible sunlight, and the time and location of sunrise and sunset, throughout the year.</p> <ul style="list-style-type: none"> • Recognize, in the northern hemisphere, the Sun appears lower in the sky during the winter and higher in the sky during the summer • Recognize, in winter, the Sun appears to rise in the Southeast and set in the Southwest, accounting for the relatively short day length and in summer the sun appears to rise in the Northeast and set in the Northwest, accounting for a relatively long day length. • Recognize the sun is never directly overhead when observed from North America. • Observe the change in time and location of moon rise, moon set, and the moon's appearance relative to time of day and month over several months, and not eh pattern in this change. • Recognize the moon rises later each day due to its revolution around the Earth in a counterclockwise direction. • Recognize the moon is in the sky for roughly 12 hours in a 24 hour period. • Recognize that one half of the moon is always facing 	
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	<p>maps, data tables graphs and writings</p> <ul style="list-style-type: none"> • Recognize the difficulty science innovators experience as they attempt to break through accepted ideas • Recognize explanations have changed over time s a result of new evidence. • Explain how technological improvements such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve the lives here on Earth. • Identify the link between technological developments and scientific discoveries made possible through their development • Describe how technological solutions to problems can have both benefits and drawbacks. • Describe how the contributions of scientists and inventors representing different cultures, races, and gender have contributed to science, technology and human activity • Describe ways in which science and society influence one another • Identify and evaluate the physical, social, economic and environmental problems that may be overcome using science and technology. 	<p>the sun and therefore, one half of the moon is always lit</p> <ul style="list-style-type: none"> • Relate the apparent change in the moon's position in the sky as it appears to move east-to west over the course of a day to Earth's counterclockwise rotation about its axis. • Describe how the appearance of the moon that can be seen from Earth's counterclockwise rotation about its axis. • Describe how the appearance of the moon that can be seen from Earth changes approximately every 28 days in an observable pattern 	
Assessments	<p>Lab write ups, Section questions Oral presentations</p>	<p>Labs Oral presentations</p>	<p>Labs Oral presentations</p>

	<p>Data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple traits, beginning and ending times of temperatures, derived quantities</p> <p>Graphs (bar, single line, pictograph) Equations and writings. Science Binders- check points Drawings Worksheets Test</p>	<p>Drawings Openers Worksheets Test Periodic table Science binder-check points Foldable</p>	<p>Drawings Openers Worksheets Test Periodic table Science binder-check points Foldable Group presentation</p>
Activities/Resources	<p>Science Vocabulary Building 5-8 grade. Metric conversion notes and worksheet. Milli metric, metric rhymes Penny vs. water Using a balance, graduated cylinders, microscope, metric ruler lab activities and notes The Simpsons notes United streaming. Science Spot- web page.</p>	<p>Science Vocabulary Building 5-8 grade. Mysterious journey of raisins Mini metric Olympics- estimation and actual measurements using tools of science. Creating graphs and tables Scavenger hunt Diagrams of moon phases, seasons Tilt lab Color vs. absorption lab. Calendar observation of moon phases Lab- Tilt and revolution for seasons. (Styrofoam balls, toothpicks and flashlights)</p>	<p>Science Vocabulary Building 5-8 grade. Notes waves of the electromagnetic spectrum. Lenses Mirrors Lab Electricity vs. Magnetism Lab Worksheet- properties of electromagnetic waves.</p> <p>Brochure with types of radiation from stars.</p> <p>Worksheet- reflection of light. Worksheet- types of lenses Sun diagram</p> <p>H-R diagram Classification of stars related to human life. Centripetal force- You tube cat on a fan.</p> <p>Telescopes types of lenses</p>

Calendar-Based Curriculum Map: 7th grade Science

	December	January	February
Essential Question	How would you compare and contrast the observable properties and structures of the universe?	How can you use the motion of an object to describe its change in position relative to another object or point?	How do forces affect motion? How can you apply Newton's laws of motion to an objects movement?
Content	<ul style="list-style-type: none"> The earth, Sun and moon are part of a larger system that includes other planets and smaller celestial bodies The Earth has a composition and location suitable to sustain life. Forces affect motion 	<ul style="list-style-type: none"> The motion of an object is described as a change in position, direction and speed relative to another object. 	<ul style="list-style-type: none"> Forces are classified as either contact forces or non contact forces that can be described in terms of direction and magnitude. Every object exerts a gravitational force on every other object. Newton's laws of motion explain the interaction of mass and forces and are used to predict motion
Skills	<ul style="list-style-type: none"> Classify celestial bodies in the solar system into categories, sun, moon, planets and other small bodies based on physical properties. Compare and contrast the size, composition, atmosphere and surface of the planets in our solar system and Earth's moon Identify the relative proximity of common celestial bodies in the sky to the Earth Describe how the Earth's placement in the solar 	<ul style="list-style-type: none"> Describe the circular motion of a moving object as the result of force acting toward the center. Classify different types of motion Given an object in motion, calculate its speed 	<ul style="list-style-type: none"> Identify and describe the types of forces acting on an object in motion, at rest floating/sinking Compare the forces acting on an object by using a spring scale to measure them to the nearest Newton Recognize every object exerts a gravitational force of attraction on every other object. Compare the amount of gravitational force acting between objects is dependent on their mass and distance

	<p>system is favorable to sustain life.</p> <ul style="list-style-type: none"> • Compare and contrast the characteristic of other planets that are considered favorable or unfavorable to life. • Recognize an object's weight is a measure of the gravitational force acting on that object. 		<p>apart.</p> <ul style="list-style-type: none"> • Explain that when forces are balanced, objects are at rest or their motion remains constant • Explain that a change in motion is the result of unbalanced force acting upon an object. • Explain how the acceleration of a moving object is affected by the amount of net force applied and the mass of an object.
Assessments	<p>Labs Oral presentations Drawings Openers Worksheets Test Periodic table Science binder-check points Foldable Group presentation</p>	<p>Labs Oral presentations Drawings Openers Worksheets Test Science binder-check points Foldable Group presentation</p>	<p>Labs Oral presentations Drawings Openers Worksheets Test Science binder-check points Foldable Group presentation</p>
Activities/Resources	<p>Solar system size model. Notes on favorability of Earth Planet scavenger hunt Planet brochure Alien/ plant to survive on a different planet with characteristics to adapt to its environment. Calculating weight on other moons/ planets Science vocabulary</p>	<p>Vocabulary sheet Notes on calculating objects speed. Determine the speed of objects before and after collisions. Junk yard cars</p>	<p>Vocabulary Measuring force pairs using spring scales. Parachute activity. Newton's laws on motion</p> <p>Boat float activity Math sheet- calculating net force. Plotting speed and acceleration of objects</p>

Calendar-Based Curriculum Map: 7th Science

	March	April	May
Essential Question	<p>What are the six different categories for simple machines?</p> <p>How can you calculate the mechanical advantage of simple machines?</p>	<p>What common components and unique structures do Earth's systems (geosphere, atmosphere, and hydrosphere) have?</p> <p>How do Earth's Systems interact with one another as they undergo change by common processes?</p> <p>How can you use the changes in properties and states of matter provide evidence of the atomic theory of matter?</p>	<p>What common components and unique structures do Earth's systems (geosphere, atmosphere, and hydrosphere) have?</p> <p>What evidence can changes in properties and states of matter provide for the atomic theory of matter?</p>
Content	<ul style="list-style-type: none"> Simple machines affect the forces applied to an object and/or direction of movement as work is done 	<ul style="list-style-type: none"> The atmosphere is composed of a mixture of gases, including water vapor and minute particles Changes in the form of water as it moves through Earth's systems are described as the water cycle. Constantly changing properties of the atmosphere occur in patterns which are described as weather Mass is conserved during any physical or chemical change. 	<ul style="list-style-type: none"> Climate is a description of average weather conditions in a given area over time Physical changes in the state of matter that result from thermal changes can be explained by Kinetic Theory of Matter.
Skills	<ul style="list-style-type: none"> Recognize examples of work being done on an object with and without the use of simple machines. 	<ul style="list-style-type: none"> Describe the composition of Earth's atmosphere and how it circulates as air masses 	<ul style="list-style-type: none"> Differentiate between weather and climate Identify factors that affect climate

	<ul style="list-style-type: none"> • Calculate the amount of work done when a force is applied to an object over a distance. • Explain how simple machines affect the amount of effort force, distance through which a force is applied, and direction of force while doing work. • Recognize the amount of work output is never greater than the amount of work input, with or without the use of a simple machine. • Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why. 	<ul style="list-style-type: none"> • Describe the role atmosphere plays in precipitation, reflecting and filtering light from the Sun, and trapping heat energy emitted from the Earth's surface. • Explain and trace the possible paths of water through the hydrosphere, geosphere and atmosphere. • Explain how thermal energy is transferred throughout the water cycle by the processes of convection, conduction and radiation. • Explain how the differences in surface temperatures, due to the different heating and cooling of water and soil affect the temperature and movement of the air above. • Recognize the characteristics of air masses and predict their effect on the weather in a given location. • Identify weather conditions associated with cold and warm fronts. • Collect and interpret weather data. • Recognize significant changes in temperature and barometric pressure may cause dramatic weather phenomena 	<ul style="list-style-type: none"> • Relate the different forms water can take at a given geographic location • Describe the relationship between temperature and movement of atmospheric gases.
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Assessments	Labs Oral presentations Drawings Openers Worksheets Test Science binder-check points Foldable Group presentation	Labs Oral presentations Drawings Openers Worksheets Test Science binder-check points Foldable Group presentation	Labs Oral presentations Drawings Openers Worksheets Test Science binder-check points Foldable Group presentation
Activities/Resources	Classifying types of levers. Worksheet calculating mechanical advantage for different simple machines. Create a device using 3 simple machines to move a marble. Science vocabulary Set up and calculate the mechanical advantage for different simple tools.	Cloud identification drawings. Notes- on weather factors Weather Map symbol identification. Interpreting /predicting and Plotting weather data. Science vocabulary	Notes identification on types of weather. Review how revolution of Earth will affect seasons. El Nino vs. la Nina Human behavior on climate Lab- Microclimates Science vocabulary