



Our Savior Christian Academy

Curriculum Framework for: **Science**

Our Savior Christian Academy’s “Curriculum Framework for Science” is designed as a tool that will follow the same format for all grades K-4. Each grade level will have a separate section based on classroom structure, and it will be up to each individual teacher to design a lesson plan that fits their classroom needs based on these standards and suggestions. Our Savior Christian Academy’s “Curriculum Framework for Science” is offered to the glory of God that it may be a blessing among Lutheran school

educators and their students.

✠ **PHILOSOPHY** ✠

God is the Creator of all things living and non-living. He lovingly upholds all created things. God’s glory and His character are revealed through exploration, observation, and scientific study of His world. Man’s fall into sin has impacted all of creation, and it literally groans in expectation waiting for Christ’s second return, when all things will be made new. We seek to serve God as wise stewards of His resources and work to restore Creation’s original beauty.

Our Savior Christian Academy

Broad Goals

Our Savior Christian Academy's Science goals include:

- Incorporating Jesus Christ in all core areas of Science.
- Providing the children with a wide range of knowledge, skills, and related activities that help him/her to develop an understanding of the physical world.
- Encouraging the children to be confident and to communicate Science effectively through reading, writing, speaking, and listening.
- Using higher order thinking skills including comprehension, application, analysis, evaluation, and synthesis in the learning concepts in life science, earth science, and physical science.
- Displaying respect in their interactions with the environments of which they are members.
- Exhibiting organizational skills, intellectual curiosity and growth, and application of what has been learned in science both to future schoolwork and to lifelong learning.
- Providing learning experiences in which students will recognize, develop, and apply effective communication skills at or above grade level in the areas of Science.
- Students are shown strategies on how to be knowledgeable and proficient thinkers who will make positive Christ-like contributions to society.

Our Savior Christian Academy obtains this through:

- Keeping Our Savior, Jesus Christ, as the center focus on our campus and in our curriculum
- Fascinating and significant Science experiences through multi-sensory activities that incorporate the world around them.
- Applying Science to other core areas of learning.
- Adapting other subjects to add valuable perspectives to the Science curriculum.
- Teaching on an individual basis with the knowledge that children acquire an understanding of Science in an uneven way.
- Continuous assessment for analysis and planning in Science.
 - Focuses on the identification of the children's existing knowledge and strategies.
 - Updating curriculum to meet changing state standards along with student needs.

1: Properties and Principles of Matter and Energy

-Integrating Faith by teaching the scientific principles to explore, discover, and classify God’s creation.

1. Changes in properties and states of matter provide evidence of the atomic theory of matter	
Eighth	
A Objects, and the materials they are made of, have properties that can be used to describe and classify them	Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Identify elements (unique atoms) and compounds (molecules or crystals) are pure substances that have characteristic properties b. Describe the physical and chemical properties (e.g., magnetic attraction, conductivity, melting point and boiling point, reactivity) of pure substances (elements or compounds) (e.g., copper wire, aluminum wire, iron, charcoal, sulfur, water, salt, sugar, sodium bicarbonate, galena, quartz, magnetite, pyrite) using appropriate senses and tools Curriculum Properties of matter: Powerpoint, Unit Assignments http://chburrellscience.weebly.com/properties-of-matter-unit.html
DOK	a – 1, b – 2
C Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification	Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Describe evidence (e.g., diffusion of colored material into clear material such as water; light reflecting off of dust particles in air; changes in physical properties and reactivity such as gold hammered into foil, oil spreading on the surface of water, decay of organic matter, condensation of water vapor by increased pressure) that supports the theory that matter is composed of moving particles too small to be seen (atoms, molecules) Curriculum Explaining change processes using a simple particle model of matter http://www.education.leeds.ac.uk/assets/files/research/cssme/ns-tu/explaining_change_processes.pdf
DOK	a – 1

1. Changes in properties and states of matter provide evidence of the atomic theory of matter -- Continued	
Eighth	
I Mass is conserved during any physical or chemical change	Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Provide evidence that mass is conserved during a chemical change in a closed system (e.g., vinegar + baking soda, mold growing in a closed container, steel wool rusting) Scope and Sequence – Rock Cycle and Plate Tectonic b. Explain that the amount of matter remains constant while being recycled through the rock cycle Scope and Sequence – Cells and Body Systems a. Explain that the amount of matter remains constant while being recycled through food chains and food webs Curriculum 1. Learn how the three types of rock are formed as part of the rock cycle 2. Learn that rocks change over very long periods of time. 3. Learn that the same forces that produce/change rocks also produce/change landforms http://www.calacademy.org/teachers/resources/lessons/rock-cycle-roundabout/
DOK	a – 2, b – 2, c – 2

1: Properties and Principles of Matter and Energy

2. Energy has a source, can be stored, and can be transferred but is conserved within a system	
	Eighth
A	Scope and Sequence – Physical and Chemical Properties and Changes of Matter
Forms of energy have a source, a means of transfer (work and heat), and a receiver	a. Recognize and describe how chemical energy is stored in chemical compounds (e.g., energy stored in and released from food molecules, batteries, nitrogen explosives, fireworks, organic fuels) Curriculum Video on Chemical energy http://www.eschooltoday.com/energy/kinds-of-energy/what-is-chemical-energy.html
DOK	a – 1

2. Energy has a source, can be stored, and can be transferred but is conserved within a system -- Continued	
	Eighth
F	Scope and Sequence – Physical and Chemical Properties and Changes of Matter
Energy can be transferred within a system as the total amount of energy remains constant (i.e., Law of Conservation of Energy)	a. Identify the evidence of different energy transformations (e.g., explosion of light, heat, and sound, temperature change, electrical charge) that may occur as chemical energy is released during a chemical reaction Curriculum Recognize that energy can be transformed from one form to another and transferred from one object to another. When this transfer of energy takes place, the motion of both objects involved usually changes. By reading science material, combined with classroom discussion, students will synthesize their understanding of specific Labs in the Transformation of Energy Unit and finalize their definitions of kinetic, potential, transfer and transformation. Students will begin to understand that energy cannot be lost but in fact is transferred and/or transformed.
DOK	a – 1

Strand 3: Characteristics and Interactions of Living Organisms

Strand 3-Integrating Faith by teaching that God created the heavens and the earth, including all things visible and invisible, amazingly large and atomically small, living and non-living.

1. There is a fundamental unity underlying the diversity of all living organisms	
	Eighth
A	Scope and Sequence – Cells and Body Systems
Organisms have basic needs for survival	a. Recognize that most plants and animals require food and oxygen (needed to release the energy from that food) Curriculum Students use the inquiry process to determine what plants need to make food. Students observe that plants need sunlight, water, and air (carbon dioxide) to make food and that soil is needed for important minerals. They discuss the photosynthesis equation and complete a description of how they would care for a rare plant.
DOK	a – 1
D	Scope and Sequence – Cells and Body Systems
Plants and animals have different structures that serve similar functions necessary for the survival of the organism	a. Identify and contrast the structures of plants and animals that serve similar functions (e.g., taking in water and oxygen, support, response to stimuli, obtaining energy, circulation, digestion, excretion, reproduction) Curriculum Plant and animal bingo
DOK	a – 2

2. Living organisms carry out life processes in order to survive	
	Eighth
A	Scope and Sequence – Cells and Body Systems
The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means	a. Describe how the cell membrane helps regulate the transfer of materials in and out of the cell b. Identify the function of the chloroplast during photosynthesis Curriculum Photosynthesis lesson and labs: http://astroventure.arc.nasa.gov/teachers/pdf/AV-Biolesson-3.pdf
DOK	a – 1, b – 1
B	Scope and Sequence: Cells and Body Systems
Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth	a. Describe photosynthesis is a chemical change with reactants (water and carbon dioxide) and products (energy-rich sugar molecules and oxygen) that takes place in the presence of light and chlorophyll b. Describe how oxygen is needed by all cells of most organisms for the release of energy from nutrient (sugar) molecules (Do NOT assess the term cellular respiration) c. Describe the importance of the transport and exchange of oxygen and carbon dioxide to the survival of the organism Curriculum Photosynthesis lesson and labs: http://astroventure.arc.nasa.gov/teachers/pdf/AV-Biolesson-3.pdf
DOK	a – 1, b – 1, c – 1

Strand 3: Characteristics and Interactions of Living

2. Living organisms carry out life processes in order to survive – Continued	
C	Eighth
Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means	<p>Scope and Sequence: Cells and Body Systems</p> <ol style="list-style-type: none"> Identify and give examples of each level of organization (cell, tissue, organ, organ system) in multicellular organisms (plants, animals) Illustrate and explain the path water and nutrients take as they move through the transport system of a plant Explain the interactions between the circulatory and digestive systems as nutrients are processed by the digestive system, passed into the blood stream, and transported in and out of the cell Compare and contrast the processes of mechanical and chemical digestion, and their role in providing materials necessary for survival of the cell and organism Identify the importance of the transport and exchange of nutrient and waste molecules to the survival of the cell and organism Explain the interactions between the circulatory and respiratory systems in exchanging oxygen and carbon dioxide between cells and the atmosphere (when oxygen enters the body, passes into the blood stream, and is transported into the cell; carbon dioxide is transported out of the cell, passes into the blood stream, and exits the body) Explain the interactions between the nervous and muscular systems when an organism responds to a stimulus <p>Curriculum Cells, Tissues, and Organs: http://www.jayharon.com/Documents/ArtifactE.pdf Understand the how the different body systems (skeletal/muscular, circulatory, respiratory, digestive, and nervous) work and how they are related to each other. Be able to create a plan to organize thoughts and write a descriptive and detailed paragraph for each system. http://inside.mines.edu/~nstambac/Body%20Systems%20Lesson%20Plan.pdf</p>
DOK	a – 2, b – 2, c – 2, d – 2, e – 2, f – 2, g – 2

2. Living organisms carry out life processes in order to survive -- Continued	
F	Eighth
Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)	<p>Scope and Sequence – Cells and Body Systems</p> <ol style="list-style-type: none"> Predict the response the body may take to maintain internal balance during an environmental change (e.g., shivering when cold, slowing metabolism when food supply decreases or when dehydrated, adrenaline rush when frightened) <p>Curriculum HOMEOSTASIS A balancing Act http://www.msichicago.org/fileadmin/Education/learninglabs/lab_downloads/Homeostasis.pdf</p>
DOK	a – 2
G	Disease
Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms)	<p>Scope and Sequence – Disease</p> <ol style="list-style-type: none"> Explain the cause and effect of diseases (e.g., AIDS, cancer, diabetes, hypertension) on the human body (locally assessed) Relate some common diseases (i.e., cold, influenza, strep throat, dysentery, fungal infections) to the organisms that cause them (bacteria, viruses, protists, fungi) Differentiate between infectious and noninfectious diseases Explain the role of antibiotics and vaccines in the treatment and prevention of diseases <p>Curriculum Diseases: http://www.cdc.gov/excite/ScienceAmbassador/ambassador_pgm/lessonplans_middleschool.htm Disease Detectives: http://www.diseasedetectives.org/disease_detectives_teachers_guide.pdf Students will research, prepare a lesson, and then teach their classmates about a common disease and the organism that caused it</p> <p>Antibiotics and vaccines video http://education-portal.com/academy/lesson/antibiotics-and-vaccines.html#lesson</p>
DOK	a – 2, b – 2, c – 2, d – 2

Strand 3: Characteristics and Interactions of Living

3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes	
Eighth	
A	Scope and Sequence: Reproduction and Heredity
Reproduction can occur asexually or sexually	<p>a. Compare and contrast the processes of asexual and sexual reproduction, including the type and number of cells involved (one body cell in asexual, two sex cells in sexual), and the number of gene sets (body cell has two sets, sex cells have one set each) passed from parent(s) to offspring</p> <p>b. Identify examples of asexual reproduction (i.e., plants budding, binary fission of single cell organisms)</p> <p>c. Compare and contrast the reproductive mechanisms of classes of vertebrates (i.e., internal vs. external fertilization)</p> <p>d. Describe how flowering plants reproduce sexually</p> <p>Curriculum In this activity, students explore the various ways in which organisms reproduce. Students discuss the role reproduction plays in the cycle of life. They observe that no individual organism lives forever and that, to carry on their species, organisms must pass their genetic instructions on to the next generation. They learn that single-celled organisms reproduce asexually, by dividing and producing two identical copies of themselves. They learn that many plants reproduce sexually, often using complex strategies that have evolved over millions of years. Finally, they explore the pros and cons of asexual and sexual reproduction and the reasons both strategies persist. http://www.pbslearningmedia.org/resource/tdc02.sci.life.repro.lp_reproduce/reproduction/</p>
DOK	a – 2, b – 1, c – 2, d – 2
C	Scope and Sequence: Reproduction and Heredity
Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction	<p>a. Identify chromosomes as cellular structures that occur in pairs that carry hereditary information in units called genes</p> <p>b. Recognize and describe how when asexual reproduction occurs, the same genetic information found in the parent cell is copied and passed on to each new daughter cell (Assess only the concept – not the term or process of mitosis)</p> <p>c. Recognize and describe how when sexual reproduction occurs, genetic material from both parents is passed on and combined to form the genetic code for the new organism (Assess only the concept – not the term or process of meiosis)</p> <p>Curriculum Investigating reproductive strategies: http://teach.genetics.utah.edu/content/begin/traits/ReproductiveStrategies.pdf</p>
DOK	a – 1, b – 1, c – 1

Strand 3: Characteristics and Interactions of Living

3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes -- Continued	
D	Eighth
There is heritable variation within every species of organism	Scope and Sequence – Reproduction and Heredity a. Recognize and describe when asexual reproduction occurs, the daughter cell is identical to the parent cell (assuming no change in the parent genes) b. Recognize and describe when sexual reproduction occurs, the offspring is not identical to either parent due to the combining of the different genetic codes contained in each sex cell Curriculum Investigating reproductive strategies: http://teach.genetics.utah.edu/content/begin/traits/ReproductiveStrategies.pdf
DOK	a – 1, b – 1

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments

Integrating faith by discussing stewardship and caring about God’s creation through a recycling unit.

1. Organisms are interdependent with one another and with their environment -- Continued	
	Eighth
D	Scope and Sequence – Disease
The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes	a. Explain the beneficial or detrimental impact that some organisms (i.e., viruses, bacteria, protists, fungi) may have on other organisms (e.g., diseases, antibiotics, breakdown of waste, fermentation) Curriculum http://entnemdept.ifas.ufl.edu/hodges/ProtectUs/lp_webfolder/fourth_grade/lesson_plan_4th_grade.pdf
DOK	a – 2

2. Matter and energy flow through an ecosystem	
	Eighth
B	Scope and Sequence – Cells and Body Systems
Matter is recycled through an ecosystem	a. Illustrate the oxygen/carbon dioxide cycles (including the processes of photosynthesis and cellular respiration) b. Describe the processes involved in the recycling of matter in the oxygen/carbon dioxide cycles Curriculum Oxygen and Carbon Dioxide Experiment: http://lessonplanspage.com/scienceo2co2cycle47-htm/
DOK	a – 1, b – 1

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

Integrating Faith by teaching that God loves His creation and continually cares and provides for it.

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures	
A	Eighth
The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties	Scope and Sequence – Rock Cycle and Plate Tectonics a. Differentiate between minerals and rocks (which are composed of different kinds of minerals) b. Describe the distinguishing properties that can be used to classify minerals (i.e., texture, smell, luster, hardness, crystal shape, streak, reaction to magnets and acids) c. Describe the methods used to identify the distinguishing properties of minerals d. Classify rocks as sedimentary, igneous, or metamorphic Curriculum Journey through Earth: http://www.mysciencebox.org/book/export/html/557
DOK	a – 2, b – 1, c – 1, d – 2

2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes	
B	Eighth
There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates	Scope and Sequence – Rock Cycle and Plate Tectonics a. Explain convection currents are the result of uneven heating inside the mantle resulting in the melting of rock materials, convection of magma, eruption/flow of magma, and movement of crustal plates b. Explain how rock layers are affected by the folding, breaking, and uplifting of rock layers due to plate motion c. Describe how the movement of crustal plates can cause earthquakes and volcanic eruptions that can result in mountain building and trench formation Curriculum Explore Plates, Volcanoes, and Earthquakes http://www.palmbeachschools.org/multicultural/documents/EarthquakeLessonPlan.pdf
DOK	a – 2, b – 2, c – 1

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes -- Continued	
Concept	Eighth
C	Scope and Sequence – Rock Cycle and Plate Tectonics
Continual changes in Earth's materials and surface that result from internal and external processes are described by the rock cycle	<p>a. Explain how heating and cooling in the mantle layer leads to the formation of metamorphic rocks and some igneous rocks</p> <p>b. Make inferences about the formation of igneous and metamorphic rocks from their physical properties (e.g., crystal size indicates rate of cooling, air pockets or glassy texture indicate volcanic activity)</p> <p>c. Explain and diagram the external and internal processes of the rock cycle (e.g., weathering and erosion, sedimentation, compaction, heating, recrystallization, resurfacing due to forces that drive plate motion)</p> <p>Curriculum At the start of this lesson, review the rock cycle using one of the sample charts. Tell the class that today's experiment will simulate the changes caused in igneous and sedimentary rocks by heat and pressure.</p> <p>Rock Cycle Lesson Plan http://www.rocksandminerals4u.com/rock_cycle_lesson.html</p> <p>Students will predict and observe changes in their rocks when exposed to heat and pressure. Students will create "rocks" using pre-selected materials</p>
DOK	a – 2, b – 2, c – 2
D	Scope and Sequence – Rock Cycle and Plate Tectonics
Changes in the Earth over time can be inferred through rock and fossil evidence	<p>a. Describe the methods used to estimate geologic time and the age of the Earth (e.g., techniques used to date rocks and rock layers, presence of fossils)</p> <p>b. Use rock and fossil evidence to make inferences about the age, history, and changing life forms and environment of the Earth (i.e., changes in successive layers of sedimentary rock and the fossils contained within them, similarities between fossils in different geographic locations, similarities between fossils and organisms present today, fossils of organisms indicating changes in climate, fossils of extinct organisms)</p> <p>Curriculum Ken Ham http://creation.com/ken-ham</p>
DOK	a – 1, b – 2

Strand 7: Scientific Inquiry

Integrating faith by helping students understand how to use scientific principles to explore, discover, and classify God’s creation.

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking	
	Eighth
A	Scope and Sequence - All Units
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	<ul style="list-style-type: none"> a. Formulate testable questions and hypotheses b. Identify and describe the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment c. Design and conduct a valid experiment d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment e. Recognize that different kinds of questions suggest different kinds of scientific investigations (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) f. 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 <p>Curriculum Science Experiment List</p> <p>http://www.kids-sciece-experiments.com/experiments.html</p>
DOK	a – 2, b – 2, c – 4, d – 3, e – 2, f – 1
B	Scope and Sequence - All Units

Strand 7: Scientific Inquiry

Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations	<ul style="list-style-type: none"> a. Make qualitative observations using the five senses b. Determine the appropriate tools and techniques to collect data c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches) d. 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 e. Compare amounts/measurements f. Judge whether measurements and computation of quantities are reasonable g. Calculate the range and average/mean of a set of data <p>Curriculum Science Experiment List</p> <p>http://www.kids-sciece-experiments.com/experiments.html</p>
DOK	a – 1, b – 2, c – 1, d – 1, e – 2, f – 3, g – 1

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking--Continued	
C	Eighth
Scientific inquiry includes evaluation of explanations (laws/principles, theories/models) in light of evidence (data) and scientific principles (understandings)	Scope and Sequence - All Units <ul style="list-style-type: none"> a. Use quantitative and qualitative data as support for reasonable explanations (conclusions) b. Use data as support for observed patterns and relationships, and to make predictions to be tested c. Determine the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions) d. Evaluate the reasonableness of an explanation (conclusion) e. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories) <p>Curriculum Science Experiment List</p> <p>http://www.kids-sciece-experiments.com/experiments.html</p>
DOK	a – 2, b – 2, c – 2, d – 3, e -2
D	Scope and Sequence - All Units

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments

The nature of science relies upon communication of results and justification of explanations

- a. Communicate the procedures and results of investigations and explanations through:
 - ⇒ oral presentations
 - ⇒ drawings and maps
 - ⇒ data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities)
 - ⇒ graphs (bar, single line, pictograph)
 - ⇒ equations and writings

Curriculum

Science Experiment List

<http://www.kids-sciece-experiments.com/experiments.html>

DOK

a – 2

Strand 8: Impact of Science, Technology and Human Activity

Integrating faith by helping students understand how to use scientific principles to explore, discover, and classify God’s creation.

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs			
	Sixth	Seventh	Eighth
A	Scope and Sequence - All Units		
Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all	a. 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 lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)		
	Curriculum		
	Choose a technological improvement, research, evaluate information and present to class		
DOK	a – 2	a – 2	a – 2
B	Scope and Sequence - All Units		
Advances in technology often result in improved data collection and an increase in scientific information	a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)		
	Curriculum		
	Choose a technological development, research, evaluate information and present to class		
DOK	a – 2	a – 2	a – 2
C	Scope and Sequence - All Units		
Technological solutions to problems often have drawbacks as well as benefits	a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally)		
	Curriculum		
	Choose a technological solution, research, evaluate information and present to class		
DOK	a – 2	a – 2	a – 2

Strand 8: Impact of Science, Technology and Human Activity

2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time			
	Sixth	Seventh	Eighth
A	Scope and Sequence - All Units		
People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations	a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally)		
	Curriculum		
	Research, evaluate information and present to class		
DOK	a – 2	a – 2	a – 2
B	Scope and Sequence - All Units		
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	a. Describe the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton) b. Describe explanations have changed over time as a result of new evidence		
	Curriculum		
	Research, evaluate information and present to class		
DOK	a – 2, b – 2	a – 2, b – 2	a – 2, b – 2
3. Science and technology affect, and are affected by, society			
	Eighth		
B	Scope and Sequence - All Units		
Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology	a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research) b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)		
	Curriculum		
	Research, evaluate information and write a persuasive speech to be presented to class		
DOK	a – 2, b – 3	a – 2, b – 3	a – 2, b – 3