

GBCS Curriculum Guide			GRADE: 7		SUBJECT: Unit 8 Medical Detectives 45 days			
Topic	Pacing	Unit	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
Medical Detectives	13 days	Lesson 8.1 What is a Medical Detective?	For CCSS see the attached pdf file For the most current standards alignments and customizable views, go to: alignment.pltw.org	<p>Patient health can be evaluated in a variety of ways, including collecting a patient's medical history and testing vital signs.</p> <p>An epidemic is an infectious disease that spreads rapidly and sickens a large number of people.</p> <p>Medical professionals use a sequential, logical process to evaluate, diagnose, and treat patients.</p> <p>A variety of health care professionals and scientists investigate medical mysteries</p>	<p>Knowledge and Skills It is expected that students will:</p> <p>Measure vital signs including heart rate, blood pressure, and temperature.</p> <p>Demonstrate the use of technology as an important tool in the Biomedical Sciences.</p> <p>Explain the different ways a virus spreads through a population.</p> <p>Describe the spread of a viral illness after inoculation is introduced.</p> <p>Evaluate patient case files to diagnose the pathogen responsible for the patient's mystery illness.</p> <p>Describe the steps that a medical professional will take to diagnose and treat a patient.</p> <p>Provide examples how medical professionals contribute to the health and wellness of individuals.</p>	Contagious Diagnose Diastolic Pressure Epidemic Heart rate Infection Outbreak Pulse Virus Vital Signs	BP Cuff	<ul style="list-style-type: none"> • Measure vital signs including heart rate, blood pressure, and temperature. • Demonstrate the use of technology as an important tool in the Biomedical Sciences. • Explain the different ways a virus spreads through a population. • Describe the spread of a viral illness after inoculation is introduced. • Evaluate patient case files to diagnose the pathogen responsible for the patient's mystery illness. • Describe the steps that a medical professional will take to diagnose and treat a patient. • Provide examples of how medical professionals contribute to the health and wellness of individuals.

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	17 days	Lesson 8.2 Mysteries of the Human Body Systems	For CCSS see the attached pdf file. For the most current standards alignments and customizable views, go to: alignment.pltw.org	1. The nervous system collects and interprets input from the outside world using specialized receptors. 2. The brain is a complex organ that is organized into specialized regions. 3. The expression of a genetic trait through families highlights the varying patterns of genetic inheritance. 4. The unique sequence of a person's DNA can be utilized for a variety of purposes including testing for a genetic disease. 5. A mutation in the sequence of nucleotides in DNA may cause a genetic disease.	Describe how the brain collects and interprets input. Compare and contrast the senses of hearing and sight, taste and smell and how they are collected and processed by the human body. Dissect a sheep's brain, accurately identifying and describing the function of the specified structures. Compare and contrast the brains of a human and sheep. Evaluate patient family history as part of a medical exam and create a pedigree. Identify major regions of the human brain. Determine the probability of a child inheriting a genetic disease. Use appropriate laboratory methods to isolate DNA from cheek cells.	Blind Spot Brain Stem Central Nervous System Cerebellum Cerebrum Chromosome Dominant Trait Gel Electrophoresis Mutation Optic Nerve Pedigree	Forensics Kit, DNA neckless, Sesnes Kit	<ul style="list-style-type: none"> • Describe how the brain collects and interprets input. • Compare and contrast the senses of hearing and sight, taste and smell, and describe how they are collected and processed by the human body. • Identify major regions of the human brain. • Dissect a sheep's brain, accurately identifying and describing the function of the specified structures. • Compare and contrast the brains of a human and sheep. • Evaluate patient family history as part of a medical exam and create a pedigree. • Determine the probability of a child inheriting a genetic disease. • Use appropriate laboratory methods to isolate DNA from cheek cells. • Analyze how changes in the huntingtin gene affect the resulting protein and nerve cell function.

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	15 days	Lesson 8.3 Murder Mystery	For CCSS see the attached pdf file. For the most current standards alignments and customizable views, go to: alignment.pltw.org	<p>Body temperature can be used as one way to determine the approximate time of death.</p> <p>An autopsy can provide clues to the circumstances surrounding a mysterious death.</p> <p>Human DNA is a unique code of over three billion base pairs that provides a genetic blueprint of an individual.</p>	<p>Know how to use patient and ambient temperature to identify the time of death.</p> <p>Know how to use the time of death information to identify suspects.</p> <p>List the steps of an autopsy.</p> <p>Analyze a portion of an autopsy report to determine the cause of death for a murder victim.</p> <p>Use DNA gel electrophoresis to compare DNA samples.</p> <p>Defend identification of suspect using physical evidence including time of death, cause of death, and DNA crime scene analysis.</p>	<p>Algor Mortis Autopsy</p> <p>Chromosome Forensic Science</p> <p>Gene Medical Examiner</p>	<p>Goat Brain,</p> <p>Disecting Pan,</p> <p>Glove Aprons</p>	<ul style="list-style-type: none"> • Describe how the brain collects and interprets input. • Compare and contrast the senses of hearing and sight, taste and smell, and describe how they are collected and processed by the human body. • Identify major regions of the human brain. • Dissect a sheep's brain, accurately identifying and describing the function of the specified structures. • Compare and contrast the brains of a human and sheep. • Evaluate patient family history as part of a medical exam and create a pedigree. • Determine the probability of a child inheriting a genetic disease. • Use appropriate laboratory methods to isolate DNA from cheek cells. • Analyze how changes in the huntingtin gene affect the resulting protein and nerve cell function.

GBCS Curriculum Guide			GRADE: 8		SUBJECT: Science of Technology			
Topic	Pacing	Unit	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
Unit 5: Science of Technology	45 days	Lesson 5.1 Applied Chemistry (6 days)	For CCSS see the attached pdf file For the most current standards alignments and customizable views, go to: alignment.pltw.org	How has science affected technology throughout history? To answer this question students apply the concepts in physics, chemistry and nanotechnology to STEM activities and projects. 1. Chemical engineering is concerned with design, construction and operation of machines that perform chemical reactions, separations or mixes, and fluid flow to solve problems and make useful products. 2. Chemical engineers apply the knowledge and discoveries of a chemist to solve real life problems. 3. Chemical engineers work in many industries including manufacturing, pharmaceuticals, healthcare, environmental, materials, and alternative energy. 4. Chemical engineers often work on teams with other engineers, scientists, and technologists.	It is expected that students will: • Describe the difference between a chemist and a chemical engineer. • Apply science and engineering skills to make ice cream. • Follow the design process to create an adhesive. • Work with a team to solve an oil spill engineering simulation problem.	Adhesive Alternative Energy Atom Catalyst Chemical Change Chemical Engineering Chemist compound Electron Element Proton Petroleum Process Engineering Synthetic Material	o Clear plastic container o Salt water o Sand and small rocks, to make a small beach area o Flora and fauna – shrub clippings, fur scraps, feathers, pom-poms, etc. o 50 ml vegetable oil (corn, olive, sunflower, sesame, soy) o Paper bathroom cup	<i>Interpretation</i> • Students will describe the difference between a chemist and a chemical engineer. <i>Application</i> • Students will apply their knowledge of the design process to create an adhesive. <i>Perspective</i> • Students will determine the best use of their resources to clean up an oil spill. <i>Self-knowledge</i> • Through participation in group activities, students will understand and appreciate the importance of good communication skills, teamwork skills, and workforce development skills.

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		Lesson 5.2 Nanotechnology (10 days)	For CCSS see the attached pdf file For the most current standards alignments and customizable views, go to: alignment.pltw.org	<ol style="list-style-type: none"> 1. Nanotechnology is building innovative tools to study and manipulate objects at the nanometer scale, one billionth of a meter. 2. Properties of materials, such as strength, color, and resistance can be changed by nanotechnology. 3. Molecules can be arranged using nanotechnology in a way that they do not normally occur in nature. 4. Scanning Probe and Atomic Force microscopes are used to see and move individual atoms. 5. Nanotechnology will have an impact on many areas, including but not limited to electronics and computing, materials, manufacturing, energy, environment, health, medicine, national security, and space exploration. 6. Engineers, designers, and engineering technologists are needed in high demand for the development of future technology to meet societal needs and wants. 	<p><i>It is expected that students will:</i></p> <ul style="list-style-type: none"> • Demonstrate an understanding of how small a nanometer is. • Explore how nano-products are used in society today. • Identify tools and processes used to see and manipulate matter at the nanoscale. • Discuss the impact that nanotechnology has on their lives today and will have in the future. 	<p>Alloy Angstrom Clean room Nanometer Micrometer Nanotechnology micrometer scanning probe microscope</p>	CEMMS NANO Product Kit	<p>Interpretation</p> <ul style="list-style-type: none"> • Students will develop an understanding and an appreciation for how small a billionth is and how large a billion is. <p>Application</p> <ul style="list-style-type: none"> • Students will explore how nanotechnology products affect their lives and present their findings to their classmates. <p>Perspective</p> <ul style="list-style-type: none"> • Students will discern between factual and mythical statements about nanotechnology.

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		Lesson 5.3 Applied Physics (29 days)	For CCSS see the attached pdf file For the most current standards alignments and customizable views, go to: alignment.pltw.org	<ol style="list-style-type: none"> 1. There are six simple machines: the lever, pulley, wheel and axle, inclined plane, wedge, and screw. 2. Simple machines can make work easier by increasing mechanical advantage. 3. Mechanical advantage is the ratio of the force produced by a machine to the force applied to the machine. 4. Compound machines are made from a combination of several simple machines. 5. Energy cannot be created or destroyed but may be transferred into different types of energy. 6. Humans use their energy, along with simple machines, to do work by changing the state of energy of an object from potential to kinetic. 7. Work is equal to Force x Distance. 8. Prototyping is an important step in the design process and provides the designer with a scaled working model that can be used for testing. 	<p><i>It is expected that students will:</i></p> <ul style="list-style-type: none"> • Correctly identify the six simple machines and explain their applications. • Distinguish between the three classes of levers. • Identify a machine as something that helps use energy more efficiently. • Determine mechanical advantage from assembled simple machines. • Be able to compare and contrast kinetic and potential energy. • Predict the relative kinetic energy based on the mass and speed of the object. • Recognize and follow safety rules for using lab tools and machines. • Build, test, and evaluate a model of a design problem. • Analyze a product through testing methods and make modifications to the product. 	Applied Physics Closed Loop Diameter Force Friction Fulcrum Gravity Inclined Plane Jooule Kinetic Energy	Rube Goldberg; No CO2 drag race cars; Pipe insulation wrap and marbles for roller coaster	<p><i>Application</i></p> <ul style="list-style-type: none"> • Students will design and fabricate a unique product using the design process and available resources. • Students will use data collected from class experimentation to calculate acceleration, force, and velocity. <p><i>Perspective</i></p> <ul style="list-style-type: none"> • <i>Engineering notebooks will be used to keep record of students' achievements on assigned activities and projects.</i>