Course: IPC		
Curricular Unit: **Energy and Waves**	**Strand:** Electricity and Magnetism	**Duration:** 3 weeks
Content (TEKS): Northside Independent School District incorporates big ideas, enduring understandings and skills of a discipline. The curriculum units provide clarity and are aligned to the Texas Essential Knowledge and Skills.		
Universal Concepts: Cause and Effect; Energy and Matter; Structure and Function		
Content Specific Concepts: Conductors vs Insulators, Parallel and Series Circuits, Ohms Law, Electromagnetism		
English Language Proficiency Standards (ELPS): Classroom instruction must effectively integrate second language acquisition with quality content area instruction to ensure that ELLs acquire social and academic language proficiency, in English, learn the knowledge and skills in the TEKs, and reach their full academic potential.		
Understanding/Generalization: • Our ability to manipulate electric charges and their motion has allows humans to produce everything from electric lights to computers.		
Essential Questions: The student will be able to answer these questions… • How would a damaged electrical cord pose a risk? • What might happen if you use an electrical appliance while standing in water? • Compare the flow of electrons in a circuit to water flowing in a pipe. • What steps must occur to power a light bulb? • Is a house wired in series or in parallel? • How are electricity and magnetism related? • How can you determine that a wire carrying an electrical current produces an electric field? • How can you make an electromagnet stronger?		
Do: The student will be able to…		**Know:** The student will know…
4 The student knows concepts of force and motion evident in everyday life. The student is expected to: (G) examine electrical force as a universal force between any two charged objects	**4(G)**	• an electric charge is surrounded by an electric field. **• there are two types of charges (Pos. Vs Neg.).** **• like charges repel and opposite charges attract.** • an object can become electrically charged when there is an imbalance of electrons.
5 The student recognizes multiple forms of energy and knows the impact of energy transfer and energy conservation in everyday life. The student is expected to: (C) demonstrate that moving electrical charges produce magnetic forces and moving magnets produce electric forces.	**5(C)**	• a magnet is surrounded by magnetic field that exerts a force on magnetic materials. • in an electromagnet, the strength of a magnetic field can be increased by the number of loops on the wire and by increasing the current going through a wire. • a generator transforms mechanical energy into electrical energy. • magnets have poles that interact differently with each other. **• moving electrical charges produce magnetic forces.** **• moving magnets produce electrical forces.**
5 The student recognizes multiple forms of energy and knows the impact of energy transfer and energy conservation in everyday life. The student is expected to: (F) evaluate the transfer of the electrical energy in series and parallel circuits and conductive materials.	**5(F)**	**• Closed vs Open: An electrical circuit must have a closed path in order current to flow.** **• series circuit has only one path/ branch.** **• parallel circuit has more than one path/branch.** **• conducting materials allow electrons to move more easily while insulators inhibit the flow of electrons.** • the relationship between voltage, current and resistance in a circuit (Ohm's Law).
Process Standards		

(1)Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:
(A) demonstrate safe practices during laboratory and field investigations , including the appropriate use of safety showers, eyewash fountains, safety goggles or chemical splash goggles, as appropriate, and fire extinguishers
(B) know specific hazards of chemical substances such as flammability, corrosiveness, and radioactivity as summarized on the Safety Data Sheets (SDS); and
(C) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.

(2) Scientific processes. The student uses scientific practices [methods] during laboratory and field investigations. The student is expected to:
(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section;
(B) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology;
(C) collect data and make measurements with accuracy and precision;
(D) organize, analyze, evaluate, make inferences, and predict trends from data; and
(E) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphs, journals, summaries, oral reports, and technology-based reports.

(3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:
(A)analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the students
(B) communicate and apply scientific information extracted from various sources such as current events, published journal articles, and marketing materials;
(C) draw inferences based on data related to promotional materials for products and services;
(D) evaluate the impact of scientific research on society and the environment;
(E) evaluate models according to their limitations in representing biological objects or events; and
(F) research and describe the history of biology and contributions of scientists.