2019 7th Grade Science Unit 5

Content Area: **Science**
Course(s): **Science**
Time Period: **May**
Length: **16**
Status: **Published**

Enduring Understandings:

- Classify the different types of energy.
- Determine the effects of a medium on a light wave.
- Determine whether or not work is being exerted.
- Explain electro-magnetivity
- Identify and define circuit types
- Identify define waves.
- Relate work and power to energy.

Essential Questions:

- How do circuits control the flow of energy?
- How does a magnet work?
- How does light behave in specific mediums?
- How is work and power calculated?
- What are the parts of a wave?
- What are the types of energy and how are they related?
- What is a circuit?
- What is a magnet?
- What is a wave?
- What is energy?
- What is work / power?

Career Readiness, Life Literacies & Key Skills

WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

Lesson Titles:

- Intro to circuits
- Intro to electro-magnetism
- Intro to Energy
- Intro to light
- Intro to Waves
- Intro to Work / Power
- Types of Energy

Equity Considerations

LGBTQ and Disabilities Mandate

Students will engage in discussion centered around Isaac Newton who was know to have epilepsy.

STEM

LGBTQ:

Sir Francis Bacon (1561–1626)

Florence NightingaleFrancis Bacon | Philosophy, Scientific Method, & Facts | Britannica(1820-1910)

George Washington Carver (1861-1943)

Sara Josephine Baker (1873-1945)

Alan Turing (1912-1954)

Allan Cox (1926-1987)

Sally Ride (1951-2012)

Ben Barres (1954-2017)

Ruth Gates (1962-2018)

Tim Cook (1960)

Disabilities:

Leonardo da Vinci (1452-1519)- Dyslexia

Isaac Newton (1664-1727)- Epilepsy

Thomas Edison (1847-1931)- Hearing

Charles Darwin (1809-1882)- Stutter, Dyslexia

Alexander Graham Bell (1847-1922)- Deaf

Albert Einstein (1879-1955)- Aspergers

Florence B. Seibert (1897-1991)- Mobility

Stephen Hawking (1942-2019)- ALS

John Forbes Nash (1928-2015)- Schizophrenia

Temple Grandin (1947)- Autism

- Social

Asian American and Pacific Islander Mandate

Meet theoretical physicist Michio Kaku in this video profile from NOVA scienceNOW: The Secret Life of Scientists & Engineers. Inspired by Albert Einstein, who died when Kaku was just eight years old, Kaku decided that the field of theoretical physics was for him. Kaku says he usually works only with pencil and paper and that equations dance around in his head. He's thrilled in his pursuit of universal laws about the universe.

https://whyy.pbslearningmedia.org/resource/nvslos.sci.eng.kaku/michio-kaku/

- Social

Climate Change

Changes to Earth's global climate have had and will have major consequences for life on Earth. Using evidence preserved in ice for tens of thousands of years, scientists are searching for an understanding of the history of Earth's climate changes in order to better predict what the future holds for life on the planet. In this lesson, students learn about ways in which we study past climate change, and reflect on the present condition of Earth's climate. They explore the effect of greenhouse gases on Earth's atmosphere, and begin to consider the human impact on average global temperature.

https://whyy.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.lp_global1/global-climate-change-understanding-the-greenhouse-effect/

- Social

SCI.MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused climate change over the past century.

Inter-Disciplinary Connections:

LA.RH.6-8.1	Cite specific textual evidence to support analysis of primary and secondary sources.
LA.RH.6-8.2	Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
LA.RH.6-8.3	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).
LA.RH.6-8.4	Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
LA.RH.6-8.5	Describe how a text presents information (e.g., sequentially, comparatively, causally).
LA.RH.6-8.7	Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
LA.RH.6-8.8	Distinguish among fact, opinion, and reasoned judgment in a text.
LA.RH.6-8.9	Analyze the relationship between a primary and secondary source on the same topic.
LA.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
LA.RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
LA.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
LA.RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
LA.RST.6-8.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
LA.RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
LA.RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
LA.WHST.6-8.1.B	Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
LA.WHST.6-8.1.C	Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
LA.WHST.6-8.1.D	Establish and maintain a formal/academic style, approach, and form.
LA.WHST.6-8.1.E	Provide a concluding statement or section that follows from and supports the argument presented.
LA.WHST.6-8.2.A	Introduce a topic and organize ideas, concepts, and information using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.
LA.WHST.6-8.2.B	Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
LA.WHST.6-8.2.C	Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
LA.WHST.6-8.2.D	Use precise language and domain-specific vocabulary to inform about or explain the topic.

LA.WHST.6-8.2.F	Provide a concluding statement or section that follows from and supports the information or explanation presented.
LA.WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
LA.WHST.6-8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
LA.WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research.
LA.WHST.6-8.10	Write routinely over extended time frames (time for research, reflection, metacognition/self correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- Analyze data collected from lab experiments and informational texts.
- Apply knowledge of energy and waves and its properties to conduct lab experiments.
- Circuits Webquest
- Create Quizlet of unit vocabulary terms.
- Current Event Essays
- Determine whether results apply to all similar scenarios.
- Educational Game: Legends of Learning
- Guided Notes
- Ice Cream lab
- Introduce vocabulary used to describe work, power, energy and waves
- Kinetic and potential energy demos
- Post lab questions
- Predict misconceptions regarding related and advanced concepts
- Sound / Light wave demos
- Tutoring during Academic Enrichment
- Use learned knowledge to predict the outcome of similar scenarios.
- Video Clips
- Worksheets

Modifications

- Tutoring during Academic Enrichment

Formative Assessment:

- Anticipatory Set

- Closure
- Doodle-notes: Waves and light
- Graded HW assignments
- Labeling a wave worksheet
- Legends of Learning
- Light and Color EdPuzzle
- MPA review game (Jeopardy / GimKit)
- Potential / Kinetic Energy Worksheet
- Quizlet Live
- Surveys
- Warm-Up
- Waves EdPuzzle

Summative Assessment:

- Alternate Assessment
- Benchmark
- Circuits WebQuest
- Ice Cream lab post lab questions
- Marking Period Assessment
- Monthly Current event

Benchmark Assessments

- Lab practical
- Reading response
- Skills-based assessment
- Writing prompt

Alternative Assessments

- Case-based scenarios
- Concept maps
- Performance tasks
- Portfolios
- Presentations
- Problem-based assignments
- Project-based assignments
- Reflective pieces

Resources & Materials:

- Circuit demonstration kit
- Energy demonstration kit
- Household ingredients for ice cream lab.
- Lab safety equipment
- Magnets
- Middle school Chemistry, Chapter 12: Work / Machines
- Middle school Chemistry, Chapter 13-14: Energy
- Middle school Chemistry, Chapter 15-18: Light and Waves
- Middle school Chemistry, Chapter 19: Magnetism
- Middle school Chemistry, Chapter 20: Electricity and Circuits
- NewsELA
- Online Circuit Simulation
- Waves demo kit