06: Circuits

Content Area: **Science**
Course(s): **Honors Physics, AP Physics 2**
Time Period: **February**
Length: **1**
Status: **Published**

Enduring Understandings:

- Capacitance is the capacity of the capacitor to store charge
- Current into a junction must equal the current out of a junction
- Current is the amount of charge that is flowing per second
- Power is the electrical energy used per second
- Resistance is the opposition to the flow of charges
- The sum of all your voltages in a closed loop is zero.
- Voltage is the energy of each coulomb of charge

Essential Questions:

- How does the configuration of a circuit affect is operation?
- What are the underlying principles of circuit behavior?

Lesson Titles:

- Capacitors in Series or Parallel
- Internal Resistance of a Battery
- Kirchhoff's Circuit Rules
- Review of Basic Circuit Terms
- The Real Lightbulbs of New Jersey

Career Readiness, Life Literacies & Key Skills

CRP.K-12.CRP10.1	Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.
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.

Inter-Disciplinary Connections:

LA.RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
LA.RST.11-12.10	By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
LA.WHST.11-12.1.A	Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
LA.WHST.11-12.1.B	Develop claim(s) and counterclaims using sound reasoning and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.
LA.WHST.11-12.1.C	Use transitions (e.g., words, phrases, clauses) to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
LA.WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.11-12.2.E	Provide a concluding paragraph or section that supports the argument presented.
LA.WHST.11-12.10	Write routinely over extended time frames (time for reflection 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:

- Chromebook Activity
- Independent Studies
- Lectures on Basic Circuit Terms, Kirchhoff's Circuit Rules, Internal Resistance of a Battery, The Real Lightbulbs of New Jersey, and Capacitors in Series or Parallel
- Problem Solving
- Science Labs

Modifications

Formative Assessment:

- Anticipatory Set
- Closure
- Quizzes on Basic Circuit Terms, Kirchhoff's Circuit Rules, Internal Resistance of a Battery, The Real Lightbulbs of New Jersey, and Capacitors in Series or Parallel
- Warm-Up

Summative Assessment:

- Alternate Assessment
- Benchmark assessment on Circuits
- Marking Period Assessment

Alternative Assessments

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

Benchmark Assessments:

Skills-based assessment
Reading response
Writing prompt
Lab practical

Resources & Materials:

- https://sites.google.com/site/delseaphysics1/Home