

# SCSU CRISP CCSA Kit Pages 2016

**Title of Module:** DC Circuits

**Subject or Unit of Study:** Electricity, mechanics, circuits

**GRADE LEVEL** 9-12 **LENGTH OF DEMO/LESSON:** \_\_\_\_\_

## STUDENT OBJECTIVES

Students will be able to

- Students will understand the relationship between current, voltage and resistance.
- Understand a simple circuit

## NEXT GENERATION SCIENCE STANDARDS

NGSS Performance Tasks	<p><b>HS – PS3-4.</b></p> <ul style="list-style-type: none"> <li>• Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.</li> </ul>
NGSS Disciplinary Core Ideas (DCI)	<p><b>PS3.B: Conservation of Energy and Energy Transfer</b></p> <ul style="list-style-type: none"> <li>• Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light.</li> </ul> <p><b>PS3.A: Definitions of Energy</b></p> <ul style="list-style-type: none"> <li>• “Electrical energy” may mean energy stored in a battery or energy transmitted by electric currents.</li> <li>• Energy can be moved from place to place by moving objects or through sound, light, or electric currents.</li> </ul>
NGSS Cross Cutting Concepts (CCC)	<p><b>CCC 3 - Cause and Effect</b></p> <ul style="list-style-type: none"> <li>• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.</li> </ul> <p><b>CCC 5 - Energy and Matter</b></p> <ul style="list-style-type: none"> <li>• Energy can be transferred in various ways and between objects.</li> </ul>
NGSS Science and Engineering Practices (SEP)	<p><b>SEP 4 - Planning and Carrying out Investigations</b></p> <ul style="list-style-type: none"> <li>• Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.</li> </ul>

## COMMON CORE STANDARDS

CC-ELA/Literacy Standards	<p><b>WHST.11-12.7</b></p> <ul style="list-style-type: none"> <li>• Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</li> </ul>
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	<p><b>WHST.11-12.8</b></p> <ul style="list-style-type: none"> <li>Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</li> </ul> <p><b>WHST.11-12.9</b></p> <ul style="list-style-type: none"> <li>Draw evidence from informational texts to support analysis, reflection, and research.</li> </ul>
CC-Math	<p><b>HSN.Q.A.1</b></p> <ul style="list-style-type: none"> <li>Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</li> </ul> <p><b>HSN.Q.A.2</b></p> <ul style="list-style-type: none"> <li>Define appropriate quantities for the purpose of descriptive modeling.</li> </ul> <p><b>HSN.Q.A.3</b></p> <ul style="list-style-type: none"> <li>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</li> </ul>

## MATERIALS

Each kit contains enough materials for 10 setups

- 2 D Batteries
- 2 Battery holders
- 5 Bulb holders
- 5 Mini light bulbs
- ~3ft black wire

## SAFETY

Dispose of dead batteries as required by law

## LEARNER BACKGROUND

None required

## LEARNING ACTIVITY OR PROCEDURE:

Please see the printable CRISP DC Circuits student lab activity (available online in a series of 3 labs)

## ADDITIONAL RESOURCES:

Apply any links or additional information for students or teacher including videos, websites, etc.

**TEACHER NOTES:**

**PLEASE NOTE: when not testing the design, please have students disconnect the battery as they will drain very quickly.**

**STEM CAREERS:**

Electrical Engineer  
Materials Scientist  
Researcher  
Electrician  
Engineer  
Computer hardware Engineer  
Electrical Engineering Technologists  
Electrical and Electronic Engineering Technicians  
Electro-Mechanical Technicians  
Nanosystems Engineers