

# GRADE 9 ELECTRICITY - CASCADING CHALLENGES

STAO CONNEX (/USERS/STAO-CONNEX)

Can understanding basic concepts about electric circuits help us to design a game board that helps students review/test their knowledge of the key concepts learned in the electricity unit?

Resources are linked to the right.

## Curriculum Links: Overall Expectations

- |                 |  |
|-----------------|--|
| <b>Academic</b> | <b>E3.</b> demonstrate an understanding of the principles of static and current electricity<br><br><b>A1.</b> Demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analyzing and interpreting, and communicating)              |
| <b>Applied</b>  | <b>E3.</b> demonstrate an understanding of the concepts and principles of static and current electricity<br><br><b>A1.</b> Demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analyzing and interpreting, and communicating) |

## Over-arching Inquiry

Can understanding basic concepts about electric circuits help us to design a game board that helps students review/test their knowledge of the key concepts learned in the electricity unit?

### **Over-arching Critical Challenge**

Design and construct a game board that uses electric circuits and effective, well-constructed questions to help players (your classmates) review and test their knowledge of key concepts learned in the electricity unit by letting the player know when their answers to review questions are right and/or wrong.

### **Lines of Inquiry**

**Learning Goal:**

Identify the components of a simple DC circuit (e.g., electrical source, load, connecting wires, switch, fuse), and explain their functions.

**Learning Goal:**

Design, draw, and construct circuit diagrams of simple series and parallel circuits.

**Learning Goal:**

Identify key concepts learned and form good questions that assess knowledge and understanding of those key concepts.

**Learning Goal:**

Compare the differences between parallel and series circuits and analyze and interpret the effects of adding an identical load in series and in parallel in a simple circuit.

**Focus Inquiry 1:**

What are the necessary components of a good, working circuit? How do they work together to power a device (load)?

**Demonstration of Learning:**

Students are able to compare, sort, and prioritize the components of electrical circuits according to function and importance

**Focus Inquiry 2:**

How important are circuit diagrams when designing and constructing circuits?

**Demonstration of Learning:**

Design, draw and construct simple parallel and series circuits to specification, using appropriate circuit diagrams and materials

**Focus Inquiry 3:**

What are the most important concepts to understand from the electricity unit? How can they be best communicated?

**Demonstration of Learning:**

Construct 5 to 10 questions that review key concepts presented in one section of the electricity unit. Choose the most appropriate type of question for your game board. The best questions will challenge your students to think, not just memorize answers.

**Focus Inquiry 4:**

Does it matter whether loads are connected in series or parallel?

**Demonstration of Learning:**

Predict, test, and determine the effects of adding extra loads in simple vs series circuits.

**Lesson Challenges**

**Line of Inquiry 1:**

*Sort the following components of a circuit into categories.*

(Provide words and diagrams for students to sort and lead them toward sorting according to function and order in which electricity may flow.)

**Learning Goal:**

Students identify the key components of a circuit based and recognize how they are connected, based on their functions.

**Line of Inquiry 2:**

*Design, draw and construct a circuit to the following specifications:*

(Provide samples here.)

**Learning Goal:**

Use appropriate symbols and materials to accurately design, draw, and construct circuit diagrams and circuits.

**Line of Inquiry 3:**

*Create well-constructed questions for your game board that identify the key concepts you learned in the electricity unit, including those that were most helpful in designing and constructing your game board.*

**Learning Goal:**

Identify the most relevant concepts learned and communicate them with a high degree of effectiveness.

**Line of Inquiry 4:**

*Do adding extra bulbs to a parallel vs series circuit affect the brightness of the bulb?*

**Learning Goal:**

Recognize that adding extra loads in a series circuit reduces the output of the load (e.g. brightness of a bulb) because the loads share the voltage, where adding extra loads in parallel does not affect the output because loads do not share the voltage.



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this (http://stao.ca/files/pe  
 https://connex.stao.ca/catalyst/grade-9-electricity-cascading-challenges

**RESOURCES**

- stao critical thinking rsource grade 9 electricity cascadi.docx  
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## ELEMENT

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