

Presenter Name: \_\_\_\_\_

Location: 260

Subject (Circle All That Apply): **Science** **Technology** **Engineering** Arts Mathematics

Grade Level (Circle All That Apply): Middle School **High School** **Collegiate**

Topic Title: Short Circuit VR

### Lesson Focus and Goals

**SUBJECT OBJECTIVE:**

1. Be able to problem solve through puzzles involving circuits and also be able to understand what each component of a circuit does.

**JHSL OBJECTIVE:**

1. Work with students to get them a hands on experience with Virtual Reality technology in the classroom.
2. Expose students to critical thinking skills in the STEM field.

### Texas Essential Knowledge and Skills (TEKS)

**Principles of Technology;** c.6.A & c.6.B. **AC/DC Electronics;** c.4.A, c.4.C, c.4.D, c.9.A, c.9.C, c.10.A, c.10.C, c.10.E & c.11.C. **Solid State Electronics;** c.4.C & c.6.B. **Engineering Design and Presentation I;** c.7.A, c.7.B, c.7.C, c.8.A & c.8.B. **Engineering Design and Presentation II;** c.8.B. **Engineering Design and Problem Solving;** c.5.A, c.5.B, c.5.C, c.5.D, c.5.F, c.5.G & c.5.K. **Practicum in Science, Technology, Engineering, and Mathematics;** c.2.A, c.2.C & c.5.A. **Extended Practicum in Science, Technology, Engineering, and Mathematics;** c.3.A, c.3.C, c.6.A, c.6.B & c.6.C.

### Structure/Activity

1. **Halliburton Introduction Talk** (*approx. 5 minutes, only if not have been completed before with students*)  
Even though Halliburton is an oil and gas industry, Halliburton is also very invested in the next generation of STEM Workforce. The Javelina Halliburton STEM Labs provide the opportunities to enhance high level critical thinking and problem solving skills associated with sciences, technology, engineering, math and geosciences (STEM) to talented, first-generation, at-risk and underserved high school and undergraduate students. Halliburton provides meaningful engagement and resources for students that want to explore the engineering field.
2. **Project Introduction** (*approx. 5 minutes*)  
Students will be introduced to circuits and their components and the functionality behind them as well. Concepts such as voltage, current, and resistance will be explained and utilized using ‘hands on’ experience using the VR.
3. **Level 1** (*approx. 5 minutes*)

Students will be asked to do a simple circuit where we establish a flow of current. Students will use a breadboard, and a resistor so that way there is no dangerous overflow of current and voltage.

4. **Level 2** (*approx. 5 minutes*)

Students will integrate the same circuit and principles from level one, but this time will be asked to insert an LED. The level will fail if there is still not enough resistance to stop the circuit from having too much voltage and current.

5. **Level 3** (*approx. 5 minutes*)

The circuit that is created in this level is identical to level two's, this time you are integrating the switch component to the circuit. The student will be introduced to what the switch is and how to integrate it as well.

## Learning Objective

### Content Review

*Students should know that...*

- Circuits require a source of power.
- Electricity is dangerous.
- Circuits can sometimes be complex and require critical thinking to understand.

*Students have been asked...*

1. What is Ohm's Law?
2. How much resistance is needed for a circuit with so many volts and amperes?
3. How do you connect a breadboard to a battery?

### New Content

*Students will know...*

- How and when to use Ohm's law when creating a circuit.
- How to follow a diagram when creating a circuit.

*Students will be able to...*

- Explain what current, voltage, and resistance is.
- Understand what a breadboard is and how to form basic connections.
- Be able to use Ohm's law.

## Assessment

Students will be asked to complete a quick evaluation after the workshop so we can continue to improve our services.

**Sources of Information:**

- 1.