

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: Inside the Body VR

### Lesson Focus and Goals

**SUBJECT OBJECTIVE:**

1. Explain how the blood and cells inside of the human body function together and fight off various threats to our health.

**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)

**Engineering Design and Problem Solving;** c.4.A, c.4.B, c.4.E & c.5.A. **Biotechnology;** c.4.A, & c.4.E

### 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 immersed into 7 levels journeying through the human body. Each level is an entry inside of a microscopic structure inside of the human body which function's and purpose is explained by the narrator.
3. **Level 1** (*approx. 2 minutes*)  
Students will be put inside of a blood vessel and will be shown red blood cells, white blood cells, and platelets, and also learning of how they look and their function inside of the body.
4. **Level 2** (*approx. 2 minutes*)

Students will exit the blood vessel into the macrophage within an infected tissue. The cell membrane, and molecules such as water, oxygen, and glucose are further explained.

**5. Level 3** (*approx. 1 minute*)

Students are transported into the cytoplasm of the cell. They are immediately introduced to the cytoskeleton and the three filaments that it is comprised of. Students will also learn of Kinsin and its function of the cytoskeleton.

**6. Level 4** (*approx. 1 minutes*)

This level takes you to the center of the cell. This will show students the nucleus and also learn about its membrane along side the nucleus' pores, which will allow any cellular object to enter.

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

Students enter the nucleus via nuclear pore. Concepts such as DNA and RNA are explained as well as what their role inside of the nucleus is.

**8. Level 6** (*approx. 2 minutes*)

Students exit the cell and are back into the cytoplasm. More cellular structures like the endoplasmic reticulum and mitochondria and explained.

**9. Level 7** (*approx. 2 minutes*)

Students are back outside of the cell and are introduced to the antibodies that reside outside of the cell. Antibodies collaboration with white blood cells are explained and there is also a display of what a virus attack on the cell would look like.

## Learning Objective

### Content Review

*Students should know that...*

- The body contains cells at the microscopic level.
- The simulation will contain simple concepts of biology.
- The human body is a complicated assembly with a large amount of processes going on within it.

*Students have been asked...*

1. What is the blood made of?
2. What is the center of a cell?
3. What do certain cellular structures like mitochondria and the endoplasmic reticulum do?

### New Content

*Students will know...*

- How blood vessels function and how what is inside it can repair the vessel itself.
- What is inside of a cell and the processes of how structures will interact with each other.

*Students will be able to...*

- Explain what the blood vessel contains
- Explain what is inside of a cell and what each of these structures does.
- Explain what DNA, RNA, Kinsin, and other proteins interact with each cellular structure.
- Explain the process of how white blood cells and antibodies do to protect our cells.

## **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.