Presenter Name: _____ Location: 253 &/or 262

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

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

Topic Title: Pixar in a Box Lessons

Lesson Focus and Goals

SUBJECT OBJECTIVE:

1. Students will utilize Khan Academy for their multi-hour, self-paced courses in math, science, and computer science.

JHSL OBJECTIVE:

1. Work with students to get them a hands-on experience with coding and showing its practicality for the real world.
2. Expose students to critical thinking skills in the STEM field.

Texas Essential Knowledge and Skills (TEKS)

Fundamentals of Computer Science; c.4.A, c.4. C, c.4.F, c.4.J & c.5.F. **Computer Science I**; c.1.A, c.1.B, c.2.A, c.2.C, c.2.D, c.2.H, c.4.A, c.4.B, c.4.C, c.4.G, c.4.H, c.4.I, c.4.J, c.4.K, c.4.L, c.4.O, c.4.P, c.4.U, c.4.V, c.4.W, c.6.C, c.6.F, c.6.H, c.6.I, c.6.P & c.6.Q. **Computer Science II**; c.1.A, c.1.F, c.2.A, c.2.C, c.2.D, c.3.B, c.3.D, c.3.H, c.4.A, c.4.D, c.4.F, c.4.T, c.4.U, c.4.V, c.4.BB, c.4.CC & c.4.MM. **Game Programming and Design**; 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. 10 minutes)*
   Students will be introduced to Khan Academy and its purposes for study guides and learning materials. Students will be prompted to go to the following link and enter an assigned class code. Khanacademy.org/join Once students have been prompted to join the class and create an account. Once all or most students have joined the classroom, the instructor can use the teachers account to assign one of the Disney Pixar computer science lessons to the students. The students will be able to find the assignments on the Learner Homepage if they refresh their dashboard or the can follow the links in their email from Khan Academy. Instructors will be able to follow the progress of each student and their scores for each assignment in the

lesson. Also once students have made an account to join this classroom, they may continue to use their account after the workshop to work on assignments not finished or new projects at their leisure. For students who finish the lesson at a quicker pace, may continue to use their account to look at more challenging coding to explore.

3. **Disney Pixar in a Box Lessons** (*approx. 60-90 minutes ea.*)
    a. **Effects:** Pixar effects artists create explosions, fire, and water by breaking them down into millions of tiny particles and controlling them using computer programming. In this lesson, students will use basic physics to create mini-special effects like flowing water and exploding fireworks.
    b. **Crowds:** Students discover how combinations were used to design crowds of robots in "WALL-E." This lesson introduces the counting principle using tree diagrams. This lesson contains 7 videos and 4 practice exercises which alternate back and forth.
    c. **Color Science:** Students discover one of Pixar's key modeling technologies: subdivision surfaces. This lesson introduces the split and average operations used to make smooth surfaces. This lesson contains 6 videos and 5 exercises which alternate back and forth.
    d. **Animation:** In this lesson, students will use animation tools to bring a ball to life. Along the way, students will learn some basic principles of animation. This lesson contains 6 videos and 6 exercises which alternate back and forth.

    Each option includes the following content:
    - Instructional videos and “talk-throughs”. Talk-throughs are like videos, but you can pause them and play with the code in realtime.
    - Coding challenges, which give the student a chance to practice the concept and give us a way to automatically grade them and award points.
    - A final project, a way for students to use what they’ve learned in a more creative, free-form way.

Learning Objective

Content Review	
Students should know that… ● Basic fundamentals that assemblies require programming. ● Coding should be a complicated process that takes trial and error.	*Students have been asked…* 1. Do they know what coding is and used for? 2. Do they understand what JavaScript, HTML/CSS, and SQL coding is?
New Content	
Students will know…	*Students will be able to…* ● Understand the basic concepts of coding. ● Understand how coding is structured.

• How each line of code input affects the program and the function of their software, whether databases, illustrations, or animations.	• Understand how to enter parameters and how these line of codes affects their software. • Have an idea of the trial and error programmer's use in the real world.

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. **Hour of Code Explanation:** https://www.khanacademy.org/computing/hour-of-code/hour-of-code-resources/hour-of-code-for-teachers/a/using-hour-of-code-in-your-classroom
2. **Hour of Drawing:** https://www.khanacademy.org/computing/hour-of-code/hour-of-code-lessons/hour-of-drawing-code/v/welcome-hour-of-code
3. **Hour of Webpages:** https://www.khanacademy.org/computing/hour-of-code/hour-of-html/v/making-webpages-intro
4. **Hour of Databases:** https://www.khanacademy.org/computing/hour-of-code/hour-of-sql/v/welcome-to-sql