MODIFIED UBD LESSON PLAN

STEM 101

COURSE: MIDDLE SCHOOL		
UNIT: Electronics/Coding	**EXERCISE:** Code Your Own video game	**TIME FRAME:** 2-3 Hours

PREPARATION: *Summary of "to do's" that the teacher should understand and prepare before bringing this lesson to the classroom.*

Teachers will need to ensure that the proper supplies are available for students to build their solutions.

For this activity, you will need these items:

Materials:
- Online classroom Scratch account

Tools:
- Pencil
- Computer or Chromebook

SAFETY: *Summary of safety strategies in the lesson.*

Please use this space to describe safety procedures or highlights for this lesson.

S1 DESIRED RESULTS:

ESTABLISHED GOALS:

Problem Solving Techniques and Applications Standards:

TRANSFER:

Students will be able to independently use their learning to…

- Create their own video game using coding skills in Scratch

MEANING:

UNDERSTANDINGS
Students will understand that...

- Coding is used in many different industries
- Most products that are electronic incorporates coding

ESSENTIAL QUESTIONS
Students will keep considering...

- Improving coding skills
- Learning coding to become proficient

ACQUISITION OF KNOWLEDGE AND SKILL:

Students will know...

- Basic coding using Scratch
- Scratch terminology and commands

Students will be skilled at...

- Using Scratch productively
- Basic math
- Coding their own video game

S2 EVIDENCE:

EVALUATIVE CRITERIA:

- Placeholder

ASSESSMENT EVIDENCE:

Performance Task(s):

Task Placeholder
Online quiz

Other Evidence:

- Student's video game created in Scratch

S3 LEARNING PLAN: *Summary of Key Learning Events and Instruction*

1. Introduce Activity

In this activity you will code your own unique video game. The game you create will use a variety of code commands that will allow the players of your game to score points and win! Safely create a classroom online Scratch account with your teacher's assistance.

- **a.** Safely create or log in to a classroom online Scratch account with your teacher's assistance.
- **b.** Practice appropriate online responsibility and safety.
- **c.** Select a theme or storyline for your game and choose a **backdrop** and **sprites** that coordinate.
- **d.** Code the "chasing" sprite to move up, down, left, and right when the keyboard **arrow keys** are pressed.
- **e.** Code the other sprite to keep moving around the screen to **random positions**.
- **f.** Create a **variable** block to score and display a point each time the second sprite is "tagged".
- **g.** Use a **conditional** to end the game once the player reaches a set score.
- **h.** Make your game even more unique by choosing one or more of the following options:
- **i.** Add additional sprites as obstacles or code the game to subtract points if they are "tagged".
- **j.** Change the **looks** or **costume** of the sprite each time it is tagged, or have it **hide** to disappear.
- **k.** Code your game to advance to a new level when a set score is reached by changing the backdrop and sprites, the speed they move, or the score needed to win/move on.
- **l.** Create a "You Win" or "Game Over" type end game message.
- **m.** Other creative ideas with teacher approval

2. Brainstorm

Brainstorm ideas for your game. In this game, one sprite (character or object) will be chasing the other and earning a point each time it tags or touches it. Choose a theme or story you'd like your game to follow. Choose sprites and a backdrop to fit your ideal. Be creative and make it unique! Include a rough sketch of your plan and list what you might include to make your game more unique. See the list of suggestions. Be flexible and know your plan may change during this process.

3. Construct

Create your game in Scratch. Students need to be patient. It takes a lot of coding to make little things happen.

4. Test

Each time you click a block you are running a test of your coding program. Continue to test and modify as much as needed to finish your animation.

5. Communicate Results

- **a.** Answer the questions in the reflection section. Reflect on your design process by describing at least one test that went well and one that needed modification. Students share and/or present your game as directed by your teacher. Turn in the design brief.

Progress Monitoring:

Teacher should observe students and provide on-going feedback during the activity. While introducing the unit, the teacher will pause and ask for questions to make sure everyone understands.

Students will complete self-assessment and brainstorm how they could improve their skills in the future. At the end of the unit, there will be a quiz to measure their overall understanding.

DIFFERENTIATION: *Summary of Key Differentiation Techniques*

Please use this space to insert your differentiation techniques. Depending on the needs of students, various techniques might be needed in a classroom, therefore use the information below and experts in the area needed to design your plan for differentiation.

The ASCD Study Guide for Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.
by Carol Ann Tomlinson, Jay McTighe

Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.
by Carol Ann Tomlinson, Jay McTighe
ISBN-13: 978-1416602842
ISBN-10: 1416602844

Differentiating Reading Instruction
by Laura Robb.
ISBN13: 9780545022989

A Teacher's Guide to Differentiating Instruction
The Center for Comprehensive School Reform and Improvement

CAREER CONNECTIONS: *Summary of Career Opportunities Associated with this Lesson*

Please use this space to insert careers that might be connected to this lesson. This section will need continuous updating as new careers and emerging technologies change the opportunities available in the workforce.

Good sources for career connections:

Occupational Outlook Handbook
http://www.bls.gov/ooh

The National Career Clusters® Framework
http://www.careertech.org/career-clusters

KEYWORDS: *Please Insert Keywords from this Lesson with their Definitions*

Please use this space to insert keywords and their definitions
Use resources like dictionary.com to find definitions to your keywords