GAME:IT
Unit 1 & 2 Assessment Review

DIRECTIONS: Review and answer the following topics from Unit 1 & 2 to prepare for the Unit 1 & 2 Assessment. Refer back to previous activities and journals to complete the review below.

TOPIC 1 - What are five components that make up a game?

> 1. Goal
> 2. Challenge / conflict
> 3. Rules
> 4. Experience/interaction - fun, thrill, mental stimulation, emotional ride, artistic fantasy, social
> 5. Outcome/feedback - score, victory screen, defeat, humor, play again, win prize, change world

TOPIC 2 - Describe the engineering design cycle and lay out each step of the process.

> ASK - Define the task. Address the constraints of money, time, and resources.
> IMAGINE - Consider all the alternatives, collaborate and brainstorm.
> PLAN - Decide on a course of action. Determine what you need and how long it will take.
> CREATE - Build the project.
> IMPROVE - Test the project, fix the bugs, get feedback.
> SHARE - Friends, family, focus-groups can try the project, before release to the public.

TOPIC 3 - Define and provide an example where you might find each during gameplay: gravity, velocity, acceleration, speed, and force.

> Gravity: In a platform game, a player will fall, game-over, if it misses the last support.
> Velocity: In a challenging shooter game, bullets fly with high velocity, monsters attack from random angles at high velocity.
> Acceleration: In the pong game, the ball accelerates and flies faster between the paddles. In a racing game, the car accelerates from zero, and accelerates to go around turns.
> Speed: In a racing game, the player controls the speed of the car.

Force: In the pong game, it is simulated that the paddle applies a force to a ball.

TOPIC 4 - Explain Newton's Laws of Motion and how they apply to game design.

Newtons First Law: Inertia. An object at rest stays at rest, or continues with the same speed and direction, unless acted upon by an outside force. The race car will stay at rest until the player accelerates it. Bullets fly in a certain direction until they collide with something else.

Newton's Second Law: F = ma. The force of gravity will cause things to fall in a platformer simulation.

Newton's Third Law. Equal and Opposite. The exhaust from a rocket ship will be simulated to create forward thrust. The ping-pong ball experiences an equal and opposite simulated force with the paddle, which causes it to bounce back towards the other side of the screen.

TOPIC 5 - What does STEM stand for?

STEM is an acronym for SCIENCE, TECHNOLOGY, ENGINEERING, and MATH

TOPIC 6 - Give four examples of each of the following - input and output devices.

Input: keyboard, mouse, microphone, pen and tablet
Output: screen, speaker, printer, VR visor

TOPIC 7 - List three programming languages and how they're similar and different.

C++ is an object-oriented programming language used to program games.
C# is an object-oriented programming language developed by Microsoft.
JavaScript can be used to make 2D platform games and games for the web.

TOPIC 8 - What is computational thinking and why is it important in game design?

Computational thinking is breaking the problem of making a game into smaller pieces and planning input, outputs, events, conditions, and actions. It is necessary for making a game because computer games have lots of logical parts that require planning.

TOPIC 9 - What is an algorithm? Give three real world examples showing how we use them daily.

An algorithm is a general sequence of steps for accomplishing a task, such as making a peanut butter and jelly sandwich, deciding what to wear, and deducing what is wrong when something like a light doesn't work. Is it plugged in? Is the bulb good? Is the power in the room?

TOPIC 10 - Describe the four pillars of computational thinking and how we use them in game design.

DECOMPOSITION – Breaking a big problem down into small parts.
PATTERN RECOGNITION – Finding similarities within data or levels of a program
ABSTRACTION – Focusing on details that matter, while ignoring the less relevant information
ALGORITHMS – Step by step process to accomplish a goal

TOPIC 11 - Draw an example of a simple program for a robot to take someone's food order. Use a flowchart to show the symbols utilized in this program.

START.
 OUTPUT: May I take your order?
 INPUT: Get order:
 STORE: information in the order computer, send to the kitchen:
OUTPUT: Is there anything else?
INPUT: <YES> If yes return to step one, may I take your order?
         <NO> If no, OUTPUT: Thank you for your order, here is your total.
OUTPUT: Sum for customer to pay.

Flowchart symbols: oval: start / stop. Trapezoid: input output. Rectangle: process. Diamond: decision.
Arrow flow.

TOPIC 12 - What skills does a programmer need to have to be successful in the field? List five.

They need to be patient, detailed, and hard-working. They need to know how to break big problems into smaller units. They need to know how to work with a team of people.

TOPIC 13 - What is pseudocode and how do we utilize it in game design and programming?

Pseudocode is a high-level algorithm, a step by step set of instructions for doing something. It is in human language, not machine language. It is the first step in creating a program. It is a rough draft of a program.

TOPIC 14 - In Construct 2, describe the purpose of each of the following: events, conditions, and actions.

The action of the program is accomplished by events listed in the events sheet. Each event has a condition that triggers it and a set of actions that are performed once the condition is activated.

TOPIC 15 - What are the equations to find speed and acceleration? (Be ready to solve a problem!)

$F = ma$. Acceleration is change in speed divided by change in time. Speed is change is position divided by change of elapsed time.