Utah CTE

Creative Coding: Grades 6-8 (2023)

Design 1

1 **Problem Solving Process** 1.1

- a Students will demonstrate knowledge of the four steps of the problem solving process 1.1.A
  - 1 Define Problem 1.1.A.1
  - 2 Prepare Solution 1.1.A.2
  - 3 Try Solution 1.1.A.3
  - 4 Reflect on Outcome 1.1.A.4

2 **Algorithms** 1.2

- a Students deconstruct a task into an algorithm (simple steps). 1.2.A
- b Students write an algorithm as pseudocode. 1.2.B

3 **Development Process** 1.3

- a Students demonstrate knowledge of the development process 1.3.A
  - 1 Planning 1.3.A.1
  - 2 Designing 1.3.A.2
  - 3 Build 1.3.A.3
  - 4 Test 1.3.A.4
  - 5 Publish 1.3.A.5

Game Development 2

1 **Game Concepts** 2.1

- a Student will explore genres of computer games 2.1.A
  - 1 action, adventure, role-playing (RPG), simulation, strategy, hybrid 2.1.A.1
- b Students will demonstrate knowledge of player perspectives 2.1.B
  - 1 First Person, Third Person, Top-Down, 2D, 3D 2.1.B.1
- c Students will demonstrate knowledge of the elements of a computer game 2.1.C
  - 1 characters, storyline, strategy, danger, rewards 2.1.C.1

Students will regularly include #comments for the purpose of explaining, organizing, instructing, and ascribing. 2.1.D

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2 **Sprites** 2.2

a Students will define a sprite and identify the types of sprites used in a game. 2.2.A

1 character, background, text 2.2.A.1

2 static, animated 2.2.A.2

3 player/hero, enemy, obstacles, projectiles, food, rewards Students will create unique variables for each sprite 2.2.A.3

b Students will apply gaming coordinate system knowledge to intentionally position sprites 2.2.B

c Students will demonstrate knowledge of sprite properties by controlling them with arguments in the code. (i.e. size, color, position) 2.2.C

3 **Motion** 2.3

a Students will use loops to code iterations in a game. (i.e. spinning, shrinking, growing, positioning) 2.3.A

b Students will write code to control a sprite's velocity, acceleration or gravity. 2.3.B

c Students will create a sprite animation and use it in a game (i.e. frame by frame, looping) 2.3.C

4 **Control** 2.4

a Students will code events to allow the user to interact with a game. (i.e. mouse click, keystroke) Students will code conditionals to create collision events (i.e. score, lives) 2.4.A

b Students will incorporate user input in a game (i.e. guessing a number, choosing an adventure, madlibs) 2.4.B

5 **Randomization** 2.5

a Students will write code to randomize behaviors in a game. (i.e. sprite images, position, color and size) 2.5.A

b Students will control randomization with ranges in code. 2.5.B

6 **Enhancements** 2.6

a Students will create and call functions to customize a game. Students will write code to enhance the user experience 2.6.A

1 creative openers/endings 2.6.A.1

2 backgrounds (static/scrolling) 2.6.A.2

3 timer 2.6.A.3

4 sound/music 2.6.A.4

7 **Game Creation** 2.7

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a Students will participate independently or collaboratively in the development of a computer game that incorporates a development process and applies concepts learned throughout the course. 2.7.A