

# Video Game Design - Unit 2 - Programming a game

## Unit Focus

In Unit 2, students will use a game software to learn how to bring elements of a game design from Unit 1 to life. In that process, students will engage in the following activities that are essential to a functional and engaging game.

- coding events and actions that include movement and collisions
- drawing images to use as sprites, objects and backgrounds
- creating sprites and objects from previously designed images and their own images
- inserting sounds
- creating rooms and movement from room to room

The PBA will have students program a maze game with original characters, objects and background. The game will have 3 rooms with start and end screens that will be programmed to allow the user to replay or end the game.

## Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<p><b>Connecticut Goals and Standards</b>  <i>Computer Information Systems: 12</i></p> <ul style="list-style-type: none"> <li>• Maintain and reengineer existing code <i>CIS.6.1.A.1</i></li> </ul> <p><b>CSTA: Computer Science Standards (2017- )</b>  <i>CSTA: 9-10</i></p> <ul style="list-style-type: none"> <li>• Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests. <i>3A-AP-13</i></li> <li>• Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions. <i>3A-AP-16</i></li> <li>• Systematically design and develop programs for broad audiences by incorporating feedback from users. <i>3A-AP-19</i></li> </ul> <p><b>ITEEA - Standards for Technological Literacy</b></p>	<p><b>T1</b> Explore and hone techniques, skills, methods, and processes to create and innovate  <b>T2</b> Develop a product/solution that adheres to key parameters (e.g., cost, timeline, restrictions, available resources and audience).</p>	
	Meaning	
	Understanding(s)	Essential Question(s)
<p><b>U1</b> Levels must be designed so that they “teach” the player as they go along. They must increase in difficulty, but at the same time not be too much harder or too easy, so as to keep a player’s interest.  <b>U2</b> Once a design has been completed and a solution implemented, the solution must be tested and improved until it is acceptable. This improvement is done using the process of iteration, where steps of the design process are repeated over and over (iterated) to produce the best result.  <b>U3</b> Music/sound, graphics and animation create the mood and enhance the quality of the games.</p>	<p><b>Q1</b> Why is it important that levels are designed intelligently, rather than haphazardly?  <b>Q2</b> What happened when we tested the game? How do we use that data and available resources to make the game better over time?  <b>Q3</b> How do I model a real world situation with computer programming?  <b>Q4</b> How do artistic elements such as sound and graphics enhance the playability and functionality of games?  <b>Q5</b> How are characters and game worlds created to match the theme and mood of a story?</p>	

## Stage 1: Desired Results - Key Understandings

<p><i>Technological Literacy: K-12</i></p> <ul style="list-style-type: none"> <li>Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving. <i>10</i></li> <li>Students will develop the abilities to use and maintain technological products and systems. <i>12</i></li> <li>Students will develop an understanding of and be able to select and use information and communication technologies. <i>17</i></li> </ul> <p><b>Student Growth and Development 21st Century Capacities Matrix</b></p> <p><i>Creative Thinking</i></p> <ul style="list-style-type: none"> <li>Design: Students will be able to engage in an appropriate process to refine their product. <i>MM.2.3</i></li> </ul> <p><i>Collaboration/Communication</i></p> <ul style="list-style-type: none"> <li>Product Creation: Students will be able to effectively use a medium to communicate important information (findings, ideas, feelings, issues, etc.) for a given purpose. <i>MM.3.2</i></li> </ul>	<p><b>U4</b> Computer programming translates procedures and logic into instructions for a computer to execute.</p> <p><b>U5</b> Interactive storytelling is highly dependent on developing rich characters.</p>	
	<b>Acquisition of Knowledge and Skill</b>	
	<b>Knowledge</b>	<b>Skill(s)</b>
	<p><b>K1</b> Relative values vs. Absolute Values</p> <p><b>K2</b> Vocabulary: Sprite, game environment, event, action, instance, variable, step event, precision collision, gravity, friction, alarm, canvas, room wrap and depth of object.</p> <p><b>K3</b> Proper naming conventions for coding.</p> <p><b>K4</b> Sounds and images have different file extensions.</p> <p><b>K5</b> Accuracy in coding is essential.</p> <p><b>K6</b> The Iterative Process is a process for arriving at a decision or a desired result by repeating rounds of analysis or a cycle of operations.</p>	<p><b>S1</b> Do something repeatedly until a specific result is achieved (Iterative Process).</p> <p><b>S2</b> Draw/create a sprite/object.</p> <p><b>S3</b> Design and create the game environment.</p> <p><b>S4</b> Code an action and/or an event.</p> <p><b>S5</b> Program a game from start to finish that includes all elements of a game that is both functional and user friendly.</p>