



# Grade 5 Unit 1: Game Design via Block Coding

## Unit Focus

Students will learn about the different facets involved in game design. Using Scratch, and its block based language, students will develop, test, and debug a game. Students will have the opportunity to create their own sprites and worlds as part of their iterative design process. In the PBA, students will innovate an existing game in making it more challenging and fun to play.

## Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<b>Connecticut Goals and Standards</b> <i>Computer Information Systems: 5</i> <ul style="list-style-type: none"> <li>Apply design principles to programming tasks. <i>CIS.6.1.1.2</i></li> <li>Test, debug, and document code. <i>CIS.6.1.1.3</i></li> </ul> <b>CSTA: Computer Science Standards (2017- )</b> <i>CSTA: 3-5</i> <ul style="list-style-type: none"> <li>Create programs that use variables to store and modify data. <i>1B-AP-09</i></li> <li>Create programs that include sequences, events, loops, and conditionals. <i>1B-AP-10</i></li> <li>Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process. <i>1B-AP-11</i></li> <li>Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences. <i>1B-AP-13</i></li> <li>Test and debug (identify and fix errors) a program or algorithm to ensure it runs as <i>1B-AP-15</i></li> <li>Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development. <i>1B-AP-16</i></li> </ul> <b>Madison Public Schools Profile of a Graduate</b> <ul style="list-style-type: none"> <li>Idea Generation: Studying a problem, need or model (mentor text, political piece, documents,</li> </ul>	<i>Students will be able to independently use their learning to...</i> <b>T1</b> Explore and hone techniques, skills, methods, and processes to create and innovate	
	<b>Meaning</b>	
	<b>Understanding(s)</b>	<b>Essential Question(s)</b>
	<i>Students will understand that...</i> <b>U1</b> Complex problems can more easily be solved by breaking them down in smaller components and solving for those. <b>U2</b> Game design is a complex art that involves using an increasingly sophisticated programmatic language and capacity to make it better. <b>U3</b> Programmers debug and revise their programs to improve the stability of the program and end user experience. <b>U4</b> Collaboration with others can improve the end product by incorporating different perspectives in the game design. <b>U5</b> When an object (character, window, etc..) is presented on a screen, its position on the screen is represented by a Cartesian coordinate system.	<i>Students will keep considering...</i> <b>Q1</b> How do I break this problem down? <b>Q2</b> How do I represent something in the real world on a computer screen? <b>Q3</b> How do I trace through the operation of my program/game to find out where the problem is? What is a possible fix? To what extent does that make the program/game run better? <b>Q4</b> How do I optimize my game design for maximum fun? <b>Q5</b> What do I do when I don't know what to do? How are the resources I'm connecting with growing my capacity?
	<b>Acquisition of Knowledge and Skill</b>	
	<b>Knowledge</b>	<b>Skill(s)</b>
	<i>Students will know...</i> <b>K1</b> Use basic terminology of coding: sprite, algorithm, event, animation, broadcast, variable, sequencing, conditionals,	<i>Students will be skilled at...</i> <b>S1</b> Write basic code using block language <b>S2</b> Use and create different sprites <b>S3</b> Use block loops

## Stage 1: Desired Results - Key Understandings

<p>art work, etc.) to consider limitations and imagine new solutions/transformations. (POG.2.1)</p> <ul style="list-style-type: none"> <li>• Product Creation: Effectively use a medium to communicate important information. (POG.3.2)</li> <li>• Decision Making: Make responsible decisions, based on potential outcomes. (POG.4.2)</li> </ul>	<p>scripts, parallelism, debug, coordinate, scene, nesting and loops.</p> <p><b>K2</b> Block code is written in a sequential order</p> <p><b>K3</b> Bugs in a program are natural and are part of the iterative design process</p> <p><b>K4</b> Gaining feedback from others is an important step in optimizing your game design</p> <p><b>K5</b> The reiterative process includes: testing, debugging and revising.</p> <p><b>K6</b> Cartesian coordinate system</p>	<p><b>S4</b> Use blocks that contain variables</p> <p><b>S5</b> Use blocks that effect the orientation and placement of a sprite</p> <p><b>S6</b> Use conditional blocks</p> <p><b>S7</b> Represent age-appropriate math in the computer (e.g., variables and equations)</p> <p><b>S8</b> Set limits on given variables</p>
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