Time Frame: 7 weeks	Unit Title: Physical Computing	Course Name: Computer Science Grade 8

Stage 1 - Desired Results		

Established Goals	**Transfer**	
NH CS Standards *AP - Algorithms & Programming* ● 2-AP-10 - Use flowcharts and/or pseudocode to address complex problems as algorithms. ● 2-AP-11 - Create clearly named variables that represent different data types and perform operations on their values. ● 2-AP-12 - Design and iteratively develop programs that combine control structures, including nested loops and	*Students will be able to independently use their learning to build and program computing devices that react to and interact with the physical world.*	

	Meaning	
	UNDERSTANDINGS *Students will understand that….* *Programming goes beyond the virtual world and into the physical world* *Computer programming languages are necessary to produce interaction between a user and a device.* *Physical computing devices receive information from users and the environment through inputs, and output reactions through connected hardware.*	ESSENTIAL QUESTIONS *Students will keep considering…* *How does software interact with hardware?* *How can computers sense and respond to their environment?* *What kind of information can be communicated with hardware outputs?* *How can simple hardware be used to develop innovative new products?*

Acquisition		

	Students will know…	Students will be skilled at…
compound conditionals. ● 2-AP-13 - Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. ● 2-AP-17 - Systematically test and refine programs using a range of test cases.	● *Input* ● *Output* ● *Conditionals* ● *Variables* ● *Loops* ● *Functions*	● Programming microcontrollers to respond to input events with output ● Using conditionals to respond to sensor data ● Using variables to store data ● Using loops to solve problems by repeating commands in program ● Applying an iterator pattern to variables or properties in a loop ● Using functions to organize and reuse code ● Creating programs for a microcontroller which controls a physically constructed object

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