Robofest eAcademy Standard STEM Learning Units

Form rev. 7/16/2020

Certificate Exam Name: Scratch 3 Basics

Review date:

Primary Developer Name: CJ Chung

Reviewed by:

Learning Units		Level / Related Question #	
		Regular	Advanced
Coding, CS, and Technologies	Sequencing (specific correct order of commands)	1,2,3,4,5,6,7,8,9,12,13,14,15,16,17,18,20,21,22,23,24,25	
	Decision making; Multiple cases	3,4,5,22,23	
	Iternations, nested loops with decision structures	1,2,5,6,7,8,16,17,23,25	
	Logic flow control (repeat until, wait until…)	6,7,14,15,18,24	
	Operators; relational operators; operator precedence	4,5,6,7,12,14,15,18,21,22	
	Variables	4,5,6,7,9,12,13,15,18,21,22,24,25	
	Advanced data structures such as lists and arrays		
	Time, Timers	14	
	Events; sending receiving messages	3,10,12,13,14,15,16,17,18,23,24,25	
	Multi-tasking	10,23,25	
	Structured code design: my blocks, functions, parameters	8,9	
	Data logging; Data file handling; Data Graphing & visualization		
	Using random numbers	13,25	
	Comments	11	
	Data formatting to display	20	
	Debugging & testing; Platform specific Know-hows & Tips		
	Others: keyboard input, Stage/backdrops, sprites, pen drawing, clone sprites, point in direction, glide, touching	14,15,16,17,19,23,24,25	
Mathematics	Counting	1,2,4,5,6,7	
	Unit conversions	15	
	Ratios, Proportions, Scale		
	Math functions: Power, Square root, etc.		
	Data Analysis: Min/Max, Average, Median, Mode		
	Logic: Boolean logic, Propositional Logic	3,4,5,6,7,14,22,23	
	Length, Perimeter, Area, Volume		
	Circles: Radius, Diameter, Circumference		
	Angles, Radian	16,17	
	Pythagoras theorem		
	Trigonometry		
	Others: 2D coordinate system	18,24,25	
Science & Engineering	Basic kinematics: Motion, Displacement, Speed, Velocity, Acceleration	13,16,17,18,23,24	
	Momentum		
	Friction		
	Force; Laws of Motion		
	Gears: Reduction, Ratio, Speed, Torque (rotational force), Types		
	Simple Machines: Lever, Wheel & Axle, Pulley, etc.		
	Center of gravity		
	Sensor: types, modes (raw or %), units (rotations or degrees), calibration		
	Others:		