	Massachusetts Learning Standards for Mathematics	**Applications of the MA Learning Standards in this Robotics Curriculum**	
10.N.4	Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers.	• Pre-skills • Maze A,B,C,D	N-Q 3
	Define appropriate quantities for the purpose of descriptive modeling.		N-Q 2
10.P.1	Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive (e.g., Fibonnacci Numbers), linear, quadratic, and exponential functional relationships.	• Write code using iterative and/or recursive structure (Maze A,B,C,D). • Unplugged - Binary	A-REI 1
10.P.2	Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope.	• Write a program where the robot travels a desired route (Maze A, Maze C).	F-IF 6
10.P.5	Find solutions to quadratic equations (with real roots) by factoring, completing the square, or using the quadratic formula. Demonstrate an understanding of the equivalence of the methods.	• Calculate the distance along the length and width of the rectangle (Maze D).	A-SSE 3
10.P.6	Solve equations and inequalities including those involving absolute value of linear expressions (e.g., $|x$	• Distance calculations used to write programs where the robot travels	A-CED 1

	- 2| > 5) and apply to the solution of problems.	to desired locations.	
10.G.1	Identify figures using properties of sides, angles, and diagonals. Identify the figures' type(s) of symmetry	• Sharpen communication skills and emphasize the importance of specific vocabulary (standard opening exercise).	
10.G.3	Recognize and solve problems involving angles formed by transversals of coplanar lines. Identify and determine the measure of central and inscribed angles and their associated minor and major arcs. Recognize and solve problems associated with radii, chords, and arcs within or on the same circle.	• Sharpen communication skills and emphasize the importance of specific vocabulary (standard opening exercise).	G- CO 1
10.G.5	Solve simple triangle problems using the triangle angle sum property and/or the Pythagorean theorem	•	F-TF 8
10.G.6	Use the properties of special triangles (e.g., isosceles, equilateral, 30°–60°–90°, 45°–45°–90°) to solve problems	•	
10.G.7	Using rectangular coordinates, calculate midpoints of segments, slopes of lines and segments, and distances between two points, and apply the results to the solutions of problems	•	A-CED 1 A-CED 2
10.G.9	Draw the results, and interpret transformations on figures in the coordinate plane, e.g., translations, reflections, rotations, scale factors, and the results of successive transformations. Apply transformations to the solutions of problems.	• Pres-skill (figure 8) • Alice Projcets	G-CO 2 G-CO 3 G- CO 4 G- CO 5
10.G.11	Use vertex-edge graphs to model and solve problems	• Unplugged Activity (network)	
10.M.1	Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and triangles.	• Maze D	

10.M.2	Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area.	• Alice Projects	
10.M.3	Relate changes in the measurement of one attribute of an object to changes in other attributes, e.g., how changing the radius or height of a cylinder affects its surface area or volume.	• Alice Projects	
10.M.4	Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.	• Pre-skills • Units A,B,C,D	
12.P.4	Demonstrate an understanding of the trigonometric, exponential, and logarithmic functions.	• Maze Extensions	F-TF 1 F-TF 2
12.P.5	Perform operations on functions, including composition. Find inverses of functions.	• Writing and interrupting code. • Pre-skills • Alice Projects • Maze A, B,C,D	A- SSE CE 3
AII.P.4	Demonstrate an understanding of the exponential and logarithmic functions	•	R-RN 1 R-RN 2
AII.P.5	Perform operations on functions, including com-position. Find inverses of functions.	•	F-IF 1 F-IF 2 F-IF 3
AII.P.11	Solve everyday problems that can be modeled using polynomial, rational, exponential, logarithmic, and step functions, absolute values and square roots.	•	Modeling
AII.P.12	Identify maximum and minimum values of functions in simple situations. Apply to the solution of problems	•	F-IF 4
AII.P.13	Describe the translations and scale changes of a given function $f(x)$ resulting from substitutions for the	•	

	various parameters a, b, c, and d in y = af (b(x + c/b)) + d. In particular, describe the effect of such changes on polynomial, rational, exponential, and logarithmic functions.		
	Use units as a way to understand problems and to guide the solution of multi-step problems.	●	N-Q 1