TRUE ROBOTICS

INTRODUCTION TO ROBOTICS WITH AXLE

GRADES 6–8

This document lists the Florida learning standards addressed by Introduction to Robotics with Axle, True Robotics' grades 6–8 robotics curriculum. Standards are grouped by subject and grade level, with codes and wording as published by the Florida Department of Education.

41	14	9	64
MATH	SCIENCE	CS	TOTAL STANDARDS

MATHEMATICS

41 STANDARDS

Based on the Florida state standards

GRADE	CODE	STANDARD
6	MA.6.NSO.2.2	Extend previous understanding of multiplication and division to compute products and quotients of positive fractions by positive fractions, including mixed numbers, with procedural fluency.
6	MA.6.NSO.2.3	Solve multi-step real-world problems involving any of the four operations with positive multi-digit decimals or positive fractions, including mixed numbers.
6	MA.6.AR.1.1	Given a mathematical or real-world context, translate written descriptions into algebraic expressions and translate algebraic expressions into written descriptions.
6	MA.6.AR.2.1	Given an equation or inequality and a specified set of integer values, determine which values make the equation or inequality true or false.
6	MA.6.AR.2.2	Write and solve one-step equations in one variable within a mathematical or real-world context using addition and subtraction, where all terms and solutions are integers.
6	MA.6.AR.2.3	Write and solve one-step equations in one variable within a mathematical or real-world context using multiplication and division, where all terms and solutions are integers.
6	MA.6.AR.3.2	Given a real-world context, determine a rate for a ratio of quantities with different units. Calculate and interpret the corresponding unit rate.
6	MA.6.GR.1.2	Find distances between ordered pairs, limited to the same x-coordinate or the same y-coordinate, represented on the coordinate plane.
6	MA.6.GR.1.3	Solve mathematical and real-world problems by plotting points on a coordinate plane, including finding the perimeter or area of a rectangle.
6	MA.6.GR.2.1	Derive a formula for the area of a right triangle using a rectangle. Apply a formula to find the area of a triangle.

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GRADE	CODE	STANDARD
6	MA.6.GR.2.2	Solve mathematical and real-world problems involving the area of quadrilaterals and composite figures by decomposing them into triangles or rectangles.
6	MA.6.GR.2.3	Solve mathematical and real-world problems involving the volume of right rectangular prisms with positive rational number edge lengths using a visual model and a formula.
6	MA.6.GR.2.4	Given a mathematical or real-world context, find the surface area of right rectangular prisms and right rectangular pyramids using the figure's net.
6	MA.6.DP.1.1	Recognize and formulate a statistical question that would generate numerical data.
6	MA.6.DP.1.2	Given a numerical data set within a real-world context, find and interpret mean, median, mode and range.
6	MA.6.DP.1.4	Given a histogram or line plot within a real-world context, qualitatively describe and interpret the spread and distribution of the data, including any symmetry, skewness, gaps, clusters, outliers and the range.
7	MA.7.NSO.1.2	Rewrite rational numbers in different but equivalent forms including fractions, mixed numbers, repeating decimals and percentages to solve mathematical and real-world problems.
7	MA.7.NSO.2.2	Add, subtract, multiply and divide rational numbers with procedural fluency.
7	MA.7.NSO.2.3	Solve real-world problems involving any of the four operations with rational numbers.
7	MA.7.AR.2.2	Write and solve two-step equations in one variable within a mathematical or real-world context, where all terms are rational numbers.
7	MA.7.AR.3.1	Apply previous understanding of percentages and ratios to solve multi-step real-world percent problems.
7	MA.7.AR.3.2	Apply previous understanding of ratios to solve real-world problems involving proportions.
7	MA.7.AR.4.2	Determine the constant of proportionality within a mathematical or real-world context given a table, graph or written description of a proportional relationship.
7	MA.7.AR.4.3	Given a mathematical or real-world context, graph proportional relationships from a table, equation or a written description.
7	MA.7.AR.4.4	Given any representation of a proportional relationship, translate the representation to a written description, table or equation.
7	MA.7.GR.1.2	Solve mathematical or real-world problems involving the area of polygons or composite figures by decomposing them into triangles or quadrilaterals.
7	MA.7.GR.1.3	Explore the proportional relationship between circumferences and diameters of circles. Apply a formula for the circumference of a circle to solve mathematical and real-world problems.
7	MA.7.GR.1.4	Explore and apply a formula to find the area of a circle to solve mathematical and real-world problems.
7	MA.7.GR.1.5	Solve mathematical and real-world problems involving dimensions and areas of geometric figures, including scale drawings and scale factors.
7	MA.7.GR.2.3	Solve mathematical and real-world problems involving volume of right circular cylinders.

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GRADE	CODE	STANDARD
8	MA.8.NSO.1.1	Extend previous understanding of rational numbers to define irrational numbers within the real number system. Locate an approximate value of a numerical expression involving irrational numbers on a number line.
8	MA.8.NSO.1.2	Plot, order and compare rational and irrational numbers, represented in various forms.
8	MA.8.AR.3.2	Given a table, graph or written description of a linear relationship, determine the slope.
8	MA.8.AR.3.3	Given a table, graph or written description of a linear relationship, write an equation in slope-intercept form.
8	MA.8.AR.3.5	Given a real-world context, determine and interpret the slope and y-intercept of a two-variable linear equation from a written description, a table, a graph or an equation in slope-intercept form.
8	MA.8.AR.4.1	Given a system of two linear equations and a specified set of possible solutions, determine which ordered pairs satisfy the system of linear equations.
8	MA.8.AR.4.2	Given a system of two linear equations represented graphically on the same coordinate plane, determine whether there is one solution, no solution or infinitely many solutions.
8	MA.8.AR.4.3	Given a mathematical or real-world context, solve systems of two linear equations by graphing.
8	MA.8.F.1.2	Given a function defined by a graph or an equation, determine whether the function is a linear function. Given an input-output table, determine whether it could represent a linear function.
8	MA.8.GR.1.1	Apply the Pythagorean Theorem to solve mathematical and real-world problems involving unknown side lengths in right triangles.
8	MA.8.GR.1.2	Apply the Pythagorean Theorem to solve mathematical and real-world problems involving the distance between two points in a coordinate plane.

SCIENCE

14 STANDARDS

Based on the Florida state standards

GRADE	CODE	STANDARD
6	SC.6.P.11.1	Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.
6	SC.6.P.13.3	Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both.
6	SC.6.L.14.5	Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis.
7	SC.7.P.10.2	Observe and explain that light can be reflected, refracted, and/or absorbed.
7	SC.7.P.10.3	Recognize that light waves, sound waves, and other waves move at different speeds in different materials.

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GRADE	CODE	STANDARD
7	SC.7.P.11.1	Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.
7	SC.7.L.16.4	Recognize and explore the impact of biotechnology (cloning, genetic engineering, artificial selection) on the individual, society and the environment.
7	SC.7.L.17.3	Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.
8	SC.8.L.18.3	Construct a scientific model of the carbon cycle to show how matter and energy are continuously transferred within and between organisms and their physical environment.
8	SC.8.L.18.4	Cite evidence that living systems follow the Laws of Conservation of Mass and Energy.
8	SC.8.E.5.11	Identify and compare characteristics of the electromagnetic spectrum such as wavelength, frequency, use, and hazards and recognize its application to an understanding of planetary images and satellite photographs.
8	SC.8.P.8.1	Explore the scientific theory of atoms (also known as atomic theory) by using models to explain the motion of particles in solids, liquids, and gases.
8	SC.8.P.8.3	Explore and describe the densities of various materials through measurement of their masses and volumes.
8	SC.8.P.8.4	Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured; for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.

COMPUTER SCIENCE

9 STANDARDS

Based on the Florida state standards

GRADE	CODE	STANDARD
6	SC.6.CO.3.5	Evaluate various forms of input and output (IO) and peripheral devices.
6	SC.6.PE.1.11	Design solutions that use repetition and two-way selection.
7	SC.7.PE.1.1	Create a function for a specific purpose.
7	SC.7.PE.3.6	Perform program tracing to predict the behavior of programs.
7	SC.7.ET.1.1	Investigate the latest technologies and the potential they have to improve our lives at home, work and in society.
8	SC.8.CO.2.3	Identify the major components of a network.
8	SC.8.PE.1.5	Create an algorithm to solve one or more parts of a decomposed problem.
8	SC.8.PE.1.7	Design an application for a specified purpose.
8	SC.8.PE.1.12	Select an efficient algorithm for a given task based on certain criteria.

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SOURCES & NOTES

- The official mathematics, science and computer science standards for Florida, as published by the Florida Department of Education.
- Codes and standard wording are reproduced from the official standards documents. Clarification statements, examples and assessment boundaries are omitted.
- Grade shows the grade level at which True Robotics lessons address each standard. A range (for example K–2) marks a standard written for a grade band.
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- A lesson-level crosswalk is available on request at info@truerobotics.org.

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