TRUE ROBOTICS

INTRODUCTION TO ROBOTICS WITH AXLE

GRADES 6–8

This document lists the South Carolina 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 South Carolina Department of Education.

38	8	12	58
MATH	SCIENCE	CS	TOTAL STANDARDS

MATHEMATICS

38 STANDARDS

Based on the South Carolina state standards

GRADE	CODE	STANDARD
6	6.DPSR.1.3	Use the shape of the graph to determine whether median or mode best describes the data set.
6	6.DPSR.1.4	Calculate and interpret the median, mode, range, interquartile range in mathematical and real-world situations.
6	6.MGSR.1.1	Find the area of a triangle, square, rectangle, parallelogram, and trapezoid.
6	6.MGSR.1.2	Create nets to represent three-dimensional shapes.
6	6.MGSR.1.3	Calculate the surface area of right rectangular prisms, right triangular prisms, right rectangular pyramids, and right triangular pyramids using two-dimensional nets.
6	6.MGSR.1.4	Find the area of composite figures by decomposing them into triangles and rectangles to solve mathematical and real-world situations.
6	6.MGSR.1.5	Calculate the volume of a right rectangular prism using the formula (V = Bh) in mathematical and real-world situations.
6	6.MGSR.3.1	Plot ordered pairs in all four quadrants and identify points on a graph by writing ordered pairs.
6	6.PAFR.1.1	Use tables, graphs, verbal descriptions, and equations to represent the relationship between independent and dependent variables of functions.
6	6.PAFR.2.4	Write and evaluate expressions using variables to represent quantities in mathematical and real-world situations.
6	6.PAFR.2.5	Write and solve one-step equations and inequalities with one variable involving positive rational numbers in mathematical and real-world situations.

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GRADE	CODE	STANDARD
6	6.PAFR.3.6	Add, subtract, multiply, and divide positive fractions, including mixed numbers in mathematical and real-world situations.
7	7.MGSR.1.1	Identify the parts of a circle. Limit the parts to center, radius, diameter, and chord.
7	7.MGSR.1.2	Describe the relationship between the radius, diameter, and circumference of a circle.
7	7.MGSR.1.3	Solve mathematical and real-world situations involving circumference or area of circles.
7	7.MGSR.1.5	In mathematical and real-world situations, find the volume of right prisms and right pyramids having triangular or quadrilateral bases.
7	7.MGSR.1.6	In mathematical and real-world situations, find the surface area of right prisms and right pyramids having triangular or quadrilateral bases.
7	7.MGSR.2.2	Solve mathematical and real-world situations involving dimensions and areas of geometric figures including scale drawings and scale factors.
7	7.MGSR.3.1	Find distances between ordered pairs on the coordinate plane, limited to the same x-coordinate or the same y-coordinate.
7	7.PAFR.1.1	Apply proportional reasoning to solve problems in mathematical and real-world situations involving ratios and percentages.
7	7.PAFR.1.2	Create a model with functions that address a proportional relationship in real-world situations.
7	7.PAFR.1.3	Identify the constant of proportionality within proportional relationships.
7	7.PAFR.2.1	Write and solve multi-step equations and inequalities in one variable involving rational numbers in mathematical and real-world situations.
7	7.PAFR.2.3	Compute unit rates, including those involving complex fractions with like or different units.
7	7.PAFR.3.5	Apply all operations with rational numbers to solve problems in mathematical and real-world situations.
8	8.MGSR.1.1	Given the geometric formulas, find the volume of cones, cylinders, and spheres in mathematical and real-world situations.
8	8.MGSR.1.2	Find the distance between any two points in the coordinate plane using the Pythagorean Theorem.
8	8.MGSR.1.3	Given the Pythagorean Theorem, determine unknown side lengths in right triangles in mathematical and real-world situations.
8	8.NR.1.1	Convert any form of a rational number to any other form including fractions (mixed numbers), decimals, and percentages.
8	8.NR.2.1	Compare real numbers and write statements using is equal to (=), is not equal to (≠), is less than (<), is greater than (>), is greater than or equal to (≥), or is less than or equal to (≤).
8	8.NR.2.2	Classify and order the subsets of real numbers in the number system including natural, whole, integer, rational, and irrational numbers.
8	8.PAFR.1.1	Define an equation in slope-intercept form (y = mx + b) as being a linear function.
8	8.PAFR.1.2	Identify and describe the constant rate of change and the y-intercept of a linear function.

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GRADE	CODE	STANDARD
8	8.PAFR.1.3	Determine if a graph, table, mapping, or verbal description is a function (linear or nonlinear) or not a function.
8	8.PAFR.1.5	Use multiple representations including mappings, tables, graphs, verbal description, and equations (only when linear) of two functions to compare the functions and draw conclusions.
8	8.PAFR.2.3	Identify the rate of change for a linear function as the slope of the line.
8	8.PAFR.2.5	Given a table or a graph, identify the slope and the y-intercept of a line and write a linear equation to express that line.
8	8.PAFR.3.2	Approximate non-perfect square roots and cube roots to nearest tenth. Limit to square roots less than or equal to 400 and cube roots less than or equal to 1,000.

SCIENCE

8 STANDARDS

Based on the South Carolina state standards

GRADE	CODE	STANDARD
6	6-PS1-4	Develop and use a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
6	6-PS3-3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
6	6-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
7	7-PS3-1	Construct and interpret graphical displays of data to describe the proportional relationships of kinetic energy to the mass of an object and to the speed of an object.
8	8-PS2-1	Apply Newton's third law to design a solution to a problem involving the motion of two colliding objects.
8	8-PS2-2	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
8	8-PS4-1	Using mathematical representations, describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
8	8-PS4-3	Communicate information to support the claim that digital devices are used to improve our understanding of how waves transmit information.

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COMPUTER SCIENCE AND DIGITAL LITERACY

12 STANDARDS

Based on the South Carolina state standards

GRADE	CODE	STANDARD
6	6.CS.1.1	Identify and describe the key functional components (e.g., input devices, output devices, processor, operating system, software applications, memory, storage) of a computer.
6	6.AP.1.1	Recognize that there are multiple ways to sequence instructions that can lead to the same result.
6	6.AP.1.2	Interpret pseudocode and flowcharts.
6	6.IC.1.2	Discover positive and negative impacts of computing on society (e.g., personal, health, workforce, economy, education, culture, environment).
7	7.CS.1.1	Explore an expanded definition of computing devices (e.g., "Internet of Things," wearable technology, robotics).
7	7.AP.2.1	Write code using control structures to skip or repeat instructions.
7	7.AP.4.1	Use a beginner coding language (e.g., drag-and-drop, block-based) to design and code a moderately complex program that solves a problem.
8	8.NI.1.2	Diagram a small network using a switch and a router.
8	8.AP.3.1	Decompose a problem into functional parts.
8	8.AP.3.2	Compose a program with multiple parts.
8	8.AP.4.1	Use a beginner coding language (e.g., drag-and-drop, block-based) to design and code a complex program that solves a problem.
8	8.IC.7.3	Identify and describe emerging technologies (e.g., virtual reality, biometrics, health monitoring systems).

SOURCES & NOTES

- The official mathematics, science and computer science standards for South Carolina, as published by the South Carolina 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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