TRUE ROBOTICS

INTRODUCTION TO ROBOTICS WITH AXLE

GRADES 6–8

This document lists the Wyoming 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 Wyoming Department of Education.

31	6	5	42
MATH	SCIENCE	CS	TOTAL STANDARDS

MATHEMATICS

31 STANDARDS

Based on the Wyoming state standards

GRADE	CODE	STANDARD
6	6.RP.3b	Solve unit rate problems including those involving unit pricing and constant speed.
6	6.NS.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions by using visual fraction models and equations to represent the problem.
6	6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Find distances between points with the same first coordinate or the same second coordinate; relate absolute value and distance.
6	6.EE.6	Use variables to represent unknown numbers and write expressions when solving a real-world or mathematical problem.
6	6.EE.7	Write and solve real-world and mathematical problems in the form of one-step, linear equations involving non negative rational numbers.
6	6.G.1	Find area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
6	6.G.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures in the context of solving real-world and mathematical problems.
6	6.SP.5c	Find quantitative measures of center (median, mode and mean) and variability (range and interquartile range). Describe any overall pattern (including outliers, clusters, and distribution), with reference to the context in which the data was gathered.
7	7.RP.2	Recognize and represent proportional relationships between quantities.
7	7.RP.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

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GRADE	CODE	STANDARD
7	7.RP.2c	Represent proportional relationships with equations.
7	7.RP.2d	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
7	7.RP.3	Solve multi-step real-world and mathematical problems involving ratios and percentages.
7	7.NS.3	Solve real-world and mathematical problems involving the four arithmetic operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)
7	7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7	7.EE.4a	Write and fluently solve linear equations of the form ax + b = c and a(x + b) = c where a, b, and c are rational numbers.
7	7.G.4	Investigate the concept of circles.
7	7.G.4a	Demonstrate an understanding of the proportional relationships between diameter, radius, and circumference of a circle.
7	7.G.4c	Given the formulas for circumference and area of circles, solve real-world and mathematical problems.
7	7.G.6a	Solve real-world and mathematical problems involving: Area and surface area of objects composed of triangles and quadrilaterals
7	7.G.6b	Solve real-world and mathematical problems involving: Volume of objects composed only of right prisms having triangular or quadrilateral bases.
8	8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. Explore the real number system and its appropriate usage in real-world situations.
8	8.NS.1a	Make comparisons between rational and irrational numbers.
8	8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
8	8.EE.8a	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
8	8.EE.8b	Solve systems of two linear equations in two variables with integer solutions by graphing the equations.
8	8.EE.8c	Solve simple real-world and mathematical problems leading to two linear equations in two variables given y = mx + b form with integer solutions.
8	8.F.4	Apply the concepts of linear functions to real-world and mathematical situations.
8	8.F.4a	Understand that the slope is the constant rate of change and the y-intercept is the point where x = 0.
8	8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems.

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GRADE	CODE	STANDARD
8	8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

SCIENCE

6 STANDARDS

Based on the Wyoming state standards

GRADE	CODE	STANDARD
6	MS-PS4-1	Use mathematical representations to describe a simple model for waves, which includes how the amplitude of a wave is related to the energy in a wave.
6	MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
6	MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
8	MS-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
8	MS-PS2-1	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
8	MS-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.

COMPUTER SCIENCE

5 STANDARDS

Based on the Wyoming state standards

GRADE	CODE	STANDARD
6–8	8.CS.HS.01	Design and refine a project that combines hardware and software components to collect and exchange data.
6–8	8.AP.V.01	Using grade appropriate content and complexity, create clearly named variables that represent different data types and perform operations on their values.
6–8	8.AP.C.01	Using grade appropriate content and complexity, design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.
6–8	8.AP.M.01	Using grade appropriate content and complexity, decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
6–8	8.IC.C.01	Describe impacts associated with computing technologies that affect people's everyday activities and career options.

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SOURCES & NOTES

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