TRUE ROBOTICS

TAKING OFF WITH PILOT

GRADES 3–5

This document lists the Oklahoma learning standards addressed by Taking Off with Pilot, True Robotics' grades 3–5 robotics curriculum. Standards are grouped by subject and grade level, with codes and wording as published by the Oklahoma State Department of Education.

27	6	8	41
MATH	SCIENCE	CS	TOTAL STANDARDS

MATHEMATICS

27 STANDARDS

Based on the Oklahoma state standards

GRADE	CODE	STANDARD
3	3.N.2.1	Represent multiplication facts by modeling a variety of approaches (e.g., manipulatives, repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line, skip counting).
3	3.N.2.3	Use strategies and algorithms based on knowledge of place value and equality to fluently add and subtract up to five-digit numbers (answer not to exceed 100,000).
3	3.N.2.7	Apply the relationship between multiplication and division to represent and solve problems.
3	3.N.2.8	Use various strategies (e.g., base ten blocks, area models, arrays, repeated addition, algorithms) based on knowledge of place value, equality, and properties of addition and multiplication to multiply a two-digit factor by a one-digit factor.
3	3.N.3.4	Use models and number lines to order and compare fractions that are related to the same whole.
3	3.GM.1.3	Classify angles within a polygon as acute, right, obtuse, and straight.
3	3.GM.2.1	Find the perimeter of a polygon, given whole number lengths of the sides, using a variety of models.
3	3.GM.2.2	Analyze why length and width are multiplied to find the area of a rectangle by decomposing the rectangle into one unit by one unit squares and viewing these as rows and columns to determine the area.
3	3.GM.2.6	Choose an appropriate measurement instrument and measure the length of objects to the nearest whole yard, whole foot, or half inch.
3	3.GM.3.1	Read and write time to the nearest five-minute interval (analog and digital).

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GRADE	CODE	STANDARD
3	3.GM.3.2	Determine the solutions to problems involving addition and subtraction of time in intervals of five minutes, up to one hour, using pictorial models, number line diagrams, or other tools.
3	3.D.1.1	Collect and organize a data set with multiple categories using a frequency table, line plot, pictograph, or bar graph with scaled intervals.
4	4.N.2.2	Multiply 3-digit by 1-digit and 2-digit by 2-digit whole numbers, using various strategies, including but not limited to standard algorithms.
4	4.N.2.4	Apply and analyze models to solve multi-step problems requiring the use of addition, subtraction, and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of appropriate technology, and the context of the problem to assess the reasonableness of results.
4	4.N.2.5	Use strategies and algorithms (e.g., mental strategies, standard algorithms, partial quotients, repeated subtraction, the commutative, associative, and distributive properties) based on knowledge of place value, equality, and properties of operations to divide a 3-digit dividend by a 1-digit whole number divisor, with and without remainders.
4	4.N.3.3	Use models to order and compare whole numbers and fractions less than and greater than one, using comparative language and symbols.
4	4.GM.1.1	Identify points, lines, line segments, rays, angles, endpoints, and parallel and perpendicular lines in various models.
4	4.GM.1.2	Describe, classify, and construct quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms, and kites. Recognize quadrilaterals in various models.
4	4.GM.2.2	Find the area of polygons by determining if they can be decomposed into rectangles.
4	4.GM.3.2	Convert one measure of time to another including seconds to minutes, minutes to hours, hours to days, and vice versa, using various models.
5	5.N.2.3	Recognize that remainders can be represented in a variety of ways, including a whole number, fraction, or decimal. Determine the most meaningful form of a remainder based on the context of the problem.
5	5.N.3.1	Estimate sums and differences of fractions with like and unlike denominators, mixed numbers, and decimals to assess the reasonableness of the results.
5	5.N.3.3	Add and subtract fractions with like and unlike denominators, mixed numbers, and decimals, involving money, measurement, geometry, and data. Use various models and efficient strategies, including but not limited to standard algorithms.
5	5.GM.1.1	Describe, identify, classify, and construct triangles (equilateral, right, scalene, isosceles) by their attributes using various mathematical models.
5	5.GM.2.1	Determine the volume of rectangular prisms by the number of unit cubes (n) used to construct the shape and by the product of the dimensions of the prism $a \cdot b \cdot c = n$. Understand rectangular prisms of different dimensions (p, q, and r) can have the same volume if $a \cdot b \cdot c = p \cdot q \cdot r = n$.
5	5.GM.3.3	Apply the relationship between inches, feet, and yards to measure, convert, and compare objects to solve problems.
5	5.GM.3.4	Apply the relationship between millimeters, centimeters, and meters to measure, convert, and compare objects to solve problems.

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SCIENCE

6 STANDARDS

Based on the Oklahoma state standards

GRADE	CODE	STANDARD
3–5	G35.ETS1.1	Define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time, or cost.
3	3.PS2.1	Plan and conduct investigations on the effects of balanced and unbalanced forces on the motion of an object.
3	G35.ETS1.2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
4	4.PS3.1	Use evidence to construct an explanation relating the speed of an object to the energy of that object.
4	4.PS3.3	Ask questions and predict outcomes about the changes in energy that occur when objects collide.
5	5.PS1.3	Make observations and measurements to identify materials based on their properties.

COMPUTER SCIENCE

8 STANDARDS

Based on the Oklahoma state standards

GRADE	CODE	STANDARD
3	3.CS.D.01	Select and use computing systems to perform a variety of tasks for an intended outcome.
3	3.CS.HS.01	Model how information flows through hardware and software to accomplish tasks.
3	3.AP.A.01	Model and compare multiple algorithms for the same task.
3	3.AP.C.01	Create programs using a programming language that utilize sequencing, repetition, conditionals, and variables to solve a problem or express ideas both independently and collaboratively.
3	3.AP.M.01	Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
3	3.AP.PD.03	Analyze and debug a program that includes sequencing, repetition, and variables in a programming language.
4	4.CS.D.01	Select and use appropriate computing systems to perform a variety of tasks for an intended outcome while recognizing that users have different needs for the technology they use.
4	4.AP.C.01	Create programs using a programming language that utilize sequencing, repetition, conditionals and variables; using math operations manipulate values to solve a problem or express ideas both independently and collaboratively.

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SOURCES & NOTES

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