TRUE ROBOTICS

TAKING OFF WITH PILOT

GRADES 3–5

This document lists the Kentucky 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 Kentucky Department of Education.

29	6	5	40
MATH	SCIENCE	CS	TOTAL STANDARDS

MATHEMATICS

29 STANDARDS

Based on the Kentucky state standards

GRADE	CODE	STANDARD
3	KY.3.OA.1	Interpret and demonstrate products of whole numbers.
3	KY.3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays and measurement quantities, by using drawings and equations with a symbol for the unknown number to represent the problem.
3	KY.3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations and/or the relationship between addition and subtraction.
3	KY.3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range of 10–90 using strategies based on place value and properties of operations.
3	KY.3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line.
3	KY.3.NF.3d	Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions.
3	KY.3.MD.1	Tell and write time to the nearest minute and measure elapsed time intervals in minutes. Solve word problems involving addition and subtraction of time intervals within and across the hour in minutes.
3	KY.3.MD.4b	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
3	KY.3.MD.4c	Show the data by making a dot plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.

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GRADE	CODE	STANDARD
3	KY.3.MD.7b	Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.
3	KY.3.MD.8	Solve real world and mathematical problems involving perimeters of polygons.
3	KY.3.G.1	Classify polygons by attributes.
4	KY.4.OA.1	Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.
4	KY.4.OA.4	Find factors and multiples of numbers in the range 1-100.
4	KY.4.NBT.4	Fluently add and subtract multi-digit whole numbers using an algorithm.
4	KY.4.NBT.5	Multiply whole numbers • Up to four digit number by a one-digit number • Two-digit number by two-digit number Multiply using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays and/or area models.
4	KY.4.NBT.6	Divide up to four-digit dividends by one-digit divisors. Find whole number quotients and remainders using • strategies based on place value • the properties of operations • the relationship between multiplication and division Illustrate and explain the calculation by using equations, rectangular arrays and/or area models.
4	KY.4.NF.2	Compare two fractions with different numerators and different denominators using the symbols <, =, or >. Recognize comparisons are valid only when the two fractions refer to the same whole. Justify the conclusions.
4	KY.4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money.
4	KY.4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
4	KY.4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence of absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.
5	KY.5.NF.1	Efficiently add and subtract fractions with unlike denominators (including mixed numbers) by... • using reasoning strategies, such as counting up on a number line or creating visual fraction models • finding common denominators
5	KY.5.NF.2	Solve word problems involving addition and subtraction of fractions.
5	KY.5.NF.3	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers by using visual fraction models or equations to represent the problem.
5	KY.5.NF.4b	Find the area of a rectangle with fractional side lengths by tiling it with squares of the appropriate unit fraction side lengths and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles and represent fraction products as rectangular areas.
5	KY.5.MD.1	Convert among different size measurement units (mass, weight, liquid volume, length, time) within one system of units (metric system, U.S. standard system and time).

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GRADE	CODE	STANDARD
5	KY.5.MD.5a	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes.
5	KY.5.MD.5b	Apply the formulas V = l x w x h and V = B x h for rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
5	KY.5.MD.5c	Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

SCIENCE

6 STANDARDS

Based on the Kentucky state standards

GRADE	CODE	STANDARD
3–5	3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3	3-PS2-1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
3	3-5-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

5 STANDARDS

Based on the Kentucky state standards

GRADE	CODE	STANDARD
3–5	E-AP-01	Create, follow, compare and refine algorithms for a task.
3–5	E-AP-03	Routinely create programs using a variety of tools to express ideas, address a problem or create an artifact, individually and collaboratively.
3–5	E-AP-08	Identify and correct errors in an algorithm.
3–5	E-CS-01	Identify, select and operate appropriate software and hardware to perform a variety of tasks and recognize that users have different needs and preferences for the technology they use.
3–5	E-CS-02	Identify and describe the function of common physical components of computing systems (hardware) using appropriate terminology.

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SOURCES & NOTES

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