TAKING OFF WITH PILOT

GRADES 3–5

This document lists the Missouri 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 Missouri Department of Elementary and Secondary Education.

34	7	6	47
MATH	SCIENCE	CS	TOTAL STANDARDS

MATHEMATICS

34 STANDARDS

Based on the Missouri state standards

GRADE	CODE	STANDARD
3	3.NBT.A.3	Demonstrate fluency with addition and subtraction within 1000.
3	3.NBT.A.4	Multiply whole numbers by multiples of 10 in the range 10-90.
3	3.NF.A.3	Represent fractions on a number line.
3	3.NF.A.6	Compare two fractions with the same numerator or denominator using the symbols >, = or <, and justify the solution.
3	3.NF.A.7	Explain why fraction comparisons are only valid when the two fractions refer to the same whole.
3	3.RA.A.1	Interpret products of whole numbers.
3	3.RA.A.4	Use multiplication and division within 100 to solve problems.
3	3.GM.A.1	Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category.
3	3.GM.A.2	Distinguish rhombuses and rectangles as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to these subcategories.
3	3.GM.B.4	Tell and write time to the nearest minute.
3	3.GM.B.6	Solve problems involving addition and subtraction of minutes.
3	3.GM.B.7	Measure or estimate length, liquid volume and weight of objects.
3	3.GM.C.12	Multiply whole-number side lengths to solve problems involving the area of rectangles.
3	3.GM.D.15	Solve problems involving perimeters of polygons.

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GRADE	CODE	STANDARD
3	3.GM.D.16	Understand that rectangles can have equal perimeters but different areas, or rectangles can have equal areas but different perimeters.
3	3.DS.A.3	Create a line plot to represent data.
4	4.NBT.A.5	Demonstrate fluency with addition and subtraction of whole numbers.
4	4.NBT.A.6	Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, and justify the solution.
4	4.NBT.A.7	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, and justify the solution.
4	4.NF.A.3	Compare two fractions using the symbols >, = or <, and justify the solution.
4	4.RA.A.1	Multiply or divide to solve problems involving a multiplicative comparison.
4	4.RA.B.4	Recognize that a whole number is a multiple of each of its factors and find the multiples for a given whole number.
4	4.RA.B.5	Determine if a whole number within 100 is composite or prime, and find all factor pairs for whole numbers within 100.
4	4.GM.A.2	Classify two-dimensional shapes by their sides and/or angles.
4	4.GM.C.6a	Convert measurements in a larger unit in terms of a smaller unit.
4	4.GM.C.7	Use the four operations to solve problems involving distances, intervals of time, liquid volume, weight of objects and money.
4	4.GM.C.8	Apply the area and perimeter formulas for rectangles to solve problems.
5	5.NF.B.4	Estimate results of sums, differences and products with fractions and decimals to the thousandths.
5	5.NF.B.6	Solve problems involving addition and subtraction of fractions and mixed numbers with unlike denominators, and justify the solution.
5	5.NF.B.7a	Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths.
5	5.GM.B.4b	Understand that the volume of a right rectangular prism can be found by stacking multiple layers of the base.
5	5.GM.B.5	Apply the formulas V = l × w × h and V = B × h for volume of right rectangular prisms with whole-number edge lengths.
5	5.GM.D.8	Convert measurements of capacity, length and weight within a given measurement system.
5	5.GM.D.9	Solve multi-step problems that require measurement conversions.

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SCIENCE

7 STANDARDS

Based on the Missouri state standards

GRADE	CODE	STANDARD
3	3.ETS1.A.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.ETS1.B.1	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.PS2.A.2	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
4	4.PS2.B.1	Plan and conduct a fair test to compare and contrast the forces (measured by a spring scale in Newtons) required to overcome friction when an object moves over different surfaces (i.e., rough/smooth).
4	4.PS3.A.1	Use evidence to construct an explanation relating the speed of an object to the energy of that object.
4	4.PS3.B.1	Provide evidence to construct an explanation of an energy transformation (e.g. temperature change, light, sound, motion, and magnetic effects)
5	5.PS1.B.1	Plan and conduct investigations to separate the components of a mixture/solution by their physical properties (i.e., sorting, filtration, magnets, screening).

COMPUTER SCIENCE

6 STANDARDS

Based on the Missouri state standards

GRADE	CODE	STANDARD
3	3.CS.HS.01	Model how information flows through hardware and software to accomplish tasks.
3	3.AP.A.01	Compare multiple algorithms (sets of step-by-step instructions) for accomplishing the same task verbally and kinesthetically, with robot devices or a programming language.
3	3.AP.C.01	Collaboratively create a program using control structures (e.g., sequence, conditionals, interactive-looping) to make decisions within a program.
3	3.AP.M.01	Decompose (break down) the steps needed to solve a problem into precise sequence of instructions.
3	3.AP.PD.03	Analyze and debug a program that includes sequencing, repetition and variables in a programming language.
3	3.IC.C.01	Identify computing technologies that have changed the world and express how those technologies influence, and are influenced by, cultural practices.

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SOURCES & NOTES

- The official mathematics, science and computer science standards for Missouri, as published by the Missouri Department of Elementary and Secondary 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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