

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

MATH

8

SCIENCE

6

CS

48

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.

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 $V = l \times w \times h$ and $V = B \times h$ 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.

SCIENCE

8 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)
4	4.LS1.A.1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and plant reproduction.
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.

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.
- Standards text remains the property of its publisher and is reproduced here for alignment reference only.
- A lesson-level crosswalk is available on request at info@truerobotics.org.