TRUE ROBOTICS

TAKING OFF WITH PILOT

GRADES 3–5

This document lists the Montana 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 Montana Office of Public Instruction.

26	7	6	39
MATH	SCIENCE	CS	TOTAL STANDARDS

MATHEMATICS

26 STANDARDS

Based on the Montana state standards

GRADE	CODE	STANDARD
3	MT.3.OA.1	Understand products of whole numbers as the total number found by multiplying a number of groups by the number of objects per group.
3	MT.3.OA.3	Use multiplication and division within 100 to solve problems in context in situations involving equal groups, arrays, and measurement quantities.
3	MT.3.NBT.2	Flexibly, accurately, and efficiently 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	MT.3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.
3	MT.3.NF.2	Understand a fraction as a number on the number line
3	MT.3.NF.3	Understand the equivalence of fractions in special cases and compare fractions by reasoning about their size by: Comparing two fractions with the same numerator or the same denominator by reasoning about their size and recognizing that comparisons are valid only when the two fractions refer to the same whole, and Recording the results of fraction comparisons with the symbols >, =, or < and justifying the conclusions.
3	MT.3.MD.1	Tell and write time on an analog and digital clock to the nearest minute and measure time intervals in minutes and solve word problems in context involving addition and subtraction of time intervals in minutes.
3	MT.3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch and show the data by making a line plot where the horizontal scale is marked off in appropriate units.

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GRADE	CODE	STANDARD
3	MT.3.MD.7	Relate area to the operations of multiplication and addition by: Multiplying side lengths to find areas of rectangles with whole-number side lengths while solving problems in context and representing whole-number products as rectangular areas
3	MT.3.MD.8	Solve problems in context involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
3	MT.3.G.1	Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
4	MT.4.OA.1	Interpret a multiplication equation as a multiplicative comparison and represent verbal statements of multiplicative comparisons as multiplication equations.
4	MT.4.OA.4	Find all factor pairs for a whole number in the range 1-100, recognize that a whole number is a multiple of each of its factors, determine whether a given whole number in the range 1-1000 is a multiple of a given one-digit number, and determine whether a given whole number in the range 1-100 is prime or composite.
4	MT.4.NBT.4	Accurately and efficiently add and subtract multi-digit whole numbers using the standard algorithm.
4	MT.4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, multiply two two-digit numbers, flexibly using strategies based on place value and the properties of operations, and illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
4	MT.4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, flexibly using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division, and illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
4	MT.4.NF.2	Compare two fractions with different numerators and different denominators by creating common denominators or numerators, or by comparing to a benchmark fraction, recognize that comparisons are valid only when the two fractions refer to the same whole, record the results of comparisons with symbols >, =, <, and justify the conclusions.
4	MT.4.MD.2	Use the four operations to solve problems in context using distances, intervals of time, liquid volumes, masses of objects, and money, including problems with simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit, and represent measurement quantities using diagrams that feature a measurement scale. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.
4	MT.4.MD.3	Apply the area and perimeter formulas for rectangles including problems in context.
4	MT.4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size, recognize right triangles as a category, and identify right triangles.
5	MT.5.NF.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions.

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GRADE	CODE	STANDARD
5	MT.5.NF.2	Solve problems in context that involve addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, and use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
5	MT.5.NF.3	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b) and solve problems in context that involve division of whole numbers leading to answers in the form of fractions or mixed numbers.
5	MT.5.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction by: Finding the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, showing that the area is the same as would be found by multiplying the side lengths, multiplying fractional side lengths to find areas of rectangles, and represent representing fraction products as rectangular areas.
5	MT.5.MD.1	Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step problems in context. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.
5	MT.5.MD.5	Relate volume to the operations of multiplication and addition and volume problems including problems in context

SCIENCE

7 STANDARDS

Based on the Montana state standards

GRADE	CODE	STANDARD
3	MT.3.PS.1	plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object
3	MT.3.PS.4	define a simple design problem that can be solved by applying scientific ideas about magnets
3	MT.3.ESS.3	make a claim based on information about the merit of a design solution that reduces the impacts of a weather-related hazard
4	MT.4.PS.1	use evidence to describe the relationship between the speed of an object and the energy of that object
4	MT.4.PS.3	ask questions and predict outcomes about the changes in energy that occur when objects collide
4	MT.4.PS.7	generate and compare multiple solutions that use patterns to transfer information
5	MT.5.PS.3	observe and record qualitative and quantitative evidence to support identification of materials based on their properties

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COMPUTER SCIENCE

6 STANDARDS

Based on the Montana state standards

GRADE	CODE	STANDARD
3	CS.AP.3.1	compare and contrast multiple algorithms to complete the same task
4	CS.AP.4.1	compare and refine multiple algorithms for the same task and determine which is the most appropriate
4	CS.AP.4.3	test and debug a program or algorithm to ensure it runs as intended
4	CS.CS.4.1	explain the function of individual internal and external parts
5	CS.AP.5.3	create programs that include sequences, events, loops, and conditionals
5	CS.DA.5.2	demonstrate how to store, copy, search, retrieve, modify, and delete information using a computing device

SOURCES & NOTES

- The official mathematics, science and computer science standards for Montana, as published by the Montana Office of Public Instruction.
- 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.

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