TRUE ROBOTICS

PAVING THE WAY WITH TREADS

GRADES K–3

This document lists the Missouri learning standards addressed by Paving the Way with Treads, True Robotics' grades K–3 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.

47	41	15	5	108
MATH	ELA	CS	SCIENCE	TOTAL STANDARDS

MATHEMATICS

47 STANDARDS

Based on the Missouri state standards

GRADE	CODE	STANDARD
K	K.NS.A.1	Count to 100 by ones and tens.
K	K.NS.B.5	Say the number names when counting objects, in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K	K.NS.B.6	Demonstrate that the last number name said tells the number of objects counted and the number of objects is the same regardless of their arrangement or the order in which they were counted.
K	K.RA.A.1	Represent addition and subtraction within 10.
K	K.GM.A.1	Describe several measureable attributes of objects.
K	K.GM.A.2	Compare the measurable attributes of two objects.
K	K.GM.C.6	Identify shapes and describe objects in the environment using names of shapes, recognizing the name stays the same regardless of orientation or size.
K	K.GM.C.7	Describe the relative positions of objects in space.
K	K.DS.A.1	Classify objects into given categories; count the number of objects in each category.
K	K.DS.A.2	Compare category counts using appropriate language.
1	1.NBT.A.2	Understand two-digit numbers are composed of ten(s) and one(s).
1	1.NBT.A.3	Compare two two-digit numbers using the symbols >, = or <.
1	1.RA.A.1	Use addition and subtraction within 20 to solve problems.
1	1.RA.A.2	Solve problems that call for addition of three whole numbers whose sum is within 20.

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GRADE	CODE	STANDARD
1	1.GM.A.1	Distinguish between defining attributes versus non-defining attributes; build and draw shapes that possess defining attributes.
1	1.GM.A.2	Compose and decompose two- and three-dimensional shapes to build an understanding of part-whole relationships and the properties of the original and composite shapes.
1	1.GM.B.5	Order three or more objects by length.
1	1.GM.B.6	Compare the lengths of two objects indirectly by using a third object.
1	1.GM.B.7	Demonstrate the ability to measure length or distance using objects.
1	1.DS.A.1	Collect, organize and represent data with up to three categories.
1	1.DS.A.2	Draw conclusions from object graphs, picture graphs, T-charts and tallies.
2	2.NBT.A.1	Understand three-digit numbers are composed of hundreds, tens and ones.
2	2.NBT.A.4	Read and write numbers to 1000 using number names, base-ten numerals and expanded form.
2	2.NBT.B.6	Demonstrate fluency with addition and subtraction within 100.
2	2.NBT.C.11	Write and solve problems involving addition and subtraction within 100.
2	2.GM.A.1	Recognize and draw shapes having specified attributes, such as a given number of angles or sides.
2	2.GM.A.3	Partition circles and rectangles into two, three or four equal shares, and describe the shares and the whole.
2	2.GM.B.4	Measure the length of an object by selecting and using appropriate tools.
2	2.GM.B.6	Estimate lengths using units of inches, feet, yards, centimeters and meters.
2	2.GM.D.12	Find the value of combinations of dollar bills, quarters, dimes, nickels and pennies, using $ and ¢ appropriately.
2	2.DS.A.2	Generate measurement data to the nearest whole unit, and display the data in a line plot.
2	2.DS.A.3	Draw a picture graph or a bar graph to represent a data set with up to four categories.
2	2.DS.A.4	Solve problems using information presented in line plots, picture graphs and bar graphs.
3	3.NF.A.1	Understand a unit fraction as the quantity formed by one part when a whole is partitioned into equal parts.
3	3.NF.A.2	Understand that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole.
3	3.NF.A.3	Represent fractions on a number line.
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.RA.A.5	Determine the unknown number in a multiplication or division equation relating three whole numbers.
3	3.RA.B.6	Apply properties of operations as strategies to multiply and divide.

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GRADE	CODE	STANDARD
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.7	Measure or estimate length, liquid volume and weight of objects.
3	3.GM.C.9	Calculate area by using unit squares to cover a plane figure with no gaps or overlaps.
3	3.DS.A.1	Create frequency tables, scaled picture graphs and bar graphs to represent a data set with several categories.
3	3.DS.A.2	Solve one- and two-step problems using information presented in bar and/or picture graphs.
3	3.DS.A.3	Create a line plot to represent data.

ENGLISH LANGUAGE ARTS

41 STANDARDS

Based on the Missouri state standards

GRADE	CODE	STANDARD
K	K.RF.1.A.e	Develop print awareness in the reading process by: knowing that a sentence is comprised of a group of words separated by spaces
K	K.RF.2.A.b	Develop phonemic awareness in the reading process by: producing rhymes in response to spoken words
K	K.RF.2.A.c	Develop phonemic awareness in the reading process by: distinguishing orally presented rhyming pairs of words from non-rhyming pairs
K	K.RF.2.A.g	Develop phonemic awareness in the reading process by: isolating the initial, medial, and final sounds in spoken words
K	K.RF.3.A.b	Develop phonics in the reading process by: reading high-frequency words
K	K.L.1.B	Communicate using conventions of English language. In written text: a. print in upper- and lowercase letters; b. recognize that a sentence ends with punctuation marks; c. capitalize own first and last name; d. capitalize first word in a sentence; e. capitalize the pronoun I; f. write and name the printed letters that match the sound; g. use inventive spelling with beginning, final, and medial sounds; h. write and name letters for consonant and vowel sounds; i. use correct spelling of own first and last names.
K	K.SL.3.A.c	Speak clearly using conventions of language when presenting individually or with a group by: confirming comprehension by retelling information and asking appropriate questions based on read-alouds or other media
K	K.SL.4.A.a	Speak clearly and audibly, using conventions of language when presenting individually or with a group by: describing personal experiences using a prop, picture, or other visual aid
1	1.RF.2.A.b	Develop phonemic awareness in the reading process by: distinguishing between long and short vowel sounds

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GRADE	CODE	STANDARD
1	1.RF.3.A	Develop phonics in the reading process by: a. decoding words in context by using letter-sound knowledge; b. identifying letters for the spelling of short and long vowels; c. producing consonant blends; d. producing consonant digraphs; e. combining sounds from letters and common spelling patterns to create and decode recognizable words; f. using syllabication patterns to decode words; g. reading irregularly spelled words; h. reading root words with inflectional endings; i. reading contractions and compound words; j. reading high-frequency words; k. demonstrating decoding skills when reading.
1	1.RF.3.A.a	Develop phonics in the reading process by: decoding words in context by using letter-sound knowledge
1	1.RF.3.A.b	Develop phonics in the reading process by: identifying letters for the spelling of short and long vowels
1	1.RF.3.A.e	Develop phonics in the reading process by: combining sounds from letters and common spelling patterns to create and decode recognizable words
1	1.RF.3.A.g	Develop phonics in the reading process by: reading irregularly spelled words
1	1.RF.4.A	Read appropriate texts with fluency (rate, accuracy, expression, appropriate phrasing), with purpose, and for comprehension
1	1.L.1.B	Communicate using conventions of English language. In written text: a. print legibly, using correct spacing between words and sentences; b. use ending punctuation; c. capitalize the first letter of others' first and last names; d. use commas to separate single words in a series; e. spell words using regular spelling patterns; f. spell words phonetically using phonemic awareness and spelling knowledge; g. arrange words in alphabetical order to the first letter.
1	1.SL.3.A.c	Speak clearly and to the point, using conventions of language when presenting individually or with a group by: confirming comprehension of read-alouds and other media by retelling and asking appropriate questions
1	1.SL.4.A.a	Speak clearly, audibly, and to the point, using conventions of language when presenting individually or with a group by: explaining a topic (student-chosen) using a prop, picture, or other visual aid with assistance to show understanding
2	2.R.1.A.c	Develop and demonstrate reading skills in response to text by: seeking clarification and using information/facts and details about texts and supporting answers with evidence from text
2	2.R.1.B.c	Develop an understanding of vocabulary by: using context to determine the meaning of a new word or multiple-meaning word in text
2	2.RF.3.A.b	Develop phonics in the reading process by: distinguishing long and short vowels when reading regularly spelled one-syllable words
2	2.RF.3.A.d	Develop phonics in the reading process by: decoding words with vowel diphthongs
2	2.RF.3.A.e	Develop phonics in the reading process by: decoding words with vowel digraphs
2	2.W.1.C	Reread, revise, and edit drafts with assistance from adults/peers to: a. strengthen writing as needed by revising: main idea, details, word choice, sentence construction, event order, audience, voice; b. edit for language conventions.

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GRADE	CODE	STANDARD
2	2.W.2.A	Write opinion texts that: a. introduce a topic or text being studied, using complete sentences; b. state an opinion about the topic or text and provide reasons for the opinion; c. use specific words that are related to the topic and audience; d. use linking/transition words and phrases to signal event order; e. provide evidence of a beginning, middle, and concluding statement or section.
2	2.W.2.C	Write fiction or non-fiction narratives and poems that: a. establish a situation/topic based on the student's experience or imagination; b. introduce a main character and setting; c. develop sensory details; d. follow a logical sequence of events using complete sentences to create a beginning/middle/end; e. use linking/transition words to signal event order; f. use specific words that are related to the topic and audience.
2	2.L.1.A.b	In speech and written form, apply standard English grammar to: use collective nouns
2	2.L.1.A.c	In speech and written form, apply standard English grammar to: use common irregular nouns
2	2.L.1.B.c	In written text: use apostrophes correctly for contractions
2	2.SL.3.A.b	Speak clearly and to the point, using conventions of language when presenting individually or with a group by: confirming comprehension of read-alouds and independent reading by retelling and asking appropriate questions
2	2.SL.4.A.b	Speak clearly, audibly, and to the point, using conventions of language when presenting individually or with a group by: recalling and telling a story with details, including a beginning, middle, and end
3	3.R.1.A.b	Develop and demonstrate reading skills in response to text by: drawing conclusions and support with textual evidence
3	3.R.1.A.c	Develop and demonstrate reading skills in response to text by: summarizing a story's beginning, middle, and end determining its central message, lesson, or moral
3	3.R.1.B	Develop an understanding of vocabulary by: a. decoding and identifying the meaning of common prefixes and suffixes and knowing how they change the meaning of root words; b. using sentence-level context to determine the relevant meaning of unfamiliar words or distinguish among multiple-meaning words; c. using homographs and homophones; d. distinguishing the literal and non-literal meanings of words and phrases in context; e. determining the meaning of the new word formed when a known affix is added to a known base word; f. using a dictionary or a glossary to determine the meanings, syllabication, and pronunciation of unknown words; g. discussing analogies; h. determining the meaning of the author's use of similes and metaphors to produce imagery; i. using conversational, general academic, and domain-specific words and phrases.
3	3.R.1.B.d	Develop an understanding of vocabulary by: distinguishing the literal and non-literal meanings of words and phrases in context
3	3.R.3.A.b	Read, infer, and draw conclusions to: identify the details or facts that support the main idea
3	3.RF.3.A	Develop phonics in the reading process by: a. decoding multisyllabic words in context and independent of context by applying common spelling patterns; b. decoding words that double final consonants when adding an ending; c. using the meaning of common prefixes and suffixes; d. using the meaning of homophones; e. decoding known and unknown words by spelling patterns; f. reading irregularly spelled high-frequency words.
3	3.W.1.A.a	Follow a writing process to plan a first draft by: using a simple prewriting strategy when given the purpose and the intended audience

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GRADE	CODE	STANDARD
3	3.W.1.C	Reread, revise, and edit drafts with assistance from adults/peers to: a. develop and strengthen writing by revising: main idea; sequence (ideas); focus; beginning/middle/end; details/facts (from sources, when appropriate); word choice (related to the topic); sentence structure; transitions; audience and purpose; voice; b. edit for language conventions.
3	3.W.2.C	Write fiction or non-fiction narratives and poems that: a. establish a setting and situation/topic and introduce a narrator and/or characters; b. use narrative techniques, such as dialogue and descriptions; c. establish and organize an event sequence to establish a beginning/middle/end; d. use transition words and phrases to signal event order; e. use specific and relevant words that are related to the topic, audience, and purpose.
3	3.L.1.B.b	In written text: use an apostrophe to form possessives

COMPUTER SCIENCE

15 STANDARDS

Based on the Missouri state standards

GRADE	CODE	STANDARD
K	K.CS.D.01	With guidance, follow directions and make appropriate choices to use computing devices to perform a variety of tasks.
K	K.DA.S.01	With guidance, locate, open, modify and save an existing file with a computing device.
K	K.AP.A.01	With guidance, model daily processes and follow algorithms (sets of step-by-step instructions) to complete tasks verbally, kinesthetically, with robot devices or a programing language.
K	K.AP.C.01	With guidance, independently or collaboratively create programs to accomplish tasks using a programming language, robot device or unplugged activity that includes sequencing (i.e., emphasizing the beginning, middle and end).
K	K.AP.PD.01	With guidance, create a grade-level appropriate artifact to illustrate thoughts, ideas or sequence of events (step-by-step) manner (e.g., story map, storyboard, sequential graphic organizer).
K	K.IC.SLE.01	Exhibit good digital citizenship using technology safely, responsibly and ethically.
2	2.CS.D.01	Select and use a computing device to perform a variety of tasks for an intended outcome.
2	2.AP.A.01	With guidance, model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks verbally, kinesthetically, with robot devices or a programing language.
2	2.IC.C.01	Identify and describe how people use many types of technologies in their daily work and personal lives.
3	3.DA.CVT.01	Collect data using various programs and formats (e.g., surveys, forms) and organize the data in various visual formats (e.g., charts, graphs, tables).
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.

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GRADE	CODE	STANDARD
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.AP.PD.04	Communicate and explain your program development using comments, presentations and interactive demonstrations.

SCIENCE

5 STANDARDS

Based on the Missouri state standards

GRADE	CODE	STANDARD
1	1.ETS1.A.1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
1	1.ETS1.B.1	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
2	2.ETS1.C.1	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
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.
3	3.ETS1.C.1	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

SOURCES & NOTES

- The official mathematics, English language arts, computer science and 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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- A lesson-level crosswalk is available on request at info@truerobotics.org.

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