TRUE ROBOTICS

PAVING THE WAY WITH TREADS

GRADES K–3

This document lists the New Jersey 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 New Jersey Department of Education.

42	41	12	5	100
MATH	ELA	CS	SCIENCE	TOTAL STANDARDS

MATHEMATICS

42 STANDARDS

Based on the New Jersey state standards

GRADE	CODE	STANDARD
K–3	MP.1	Make sense of problems and persevere in solving them
K	K.CC.A.1	Count to 100 by ones and by tens.
K	K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality.
K	K.OA.A.1	Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
K	K.OA.A.2	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
K	K.M.A.1	Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
K	K.M.A.2	Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.
K	K.DL.A.1	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
K	K.G.A.1	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
K	K.G.A.2	Correctly name shapes regardless of their orientations or overall size.
1	MP.2	Reason abstractly and quantitatively

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GRADE	CODE	STANDARD
1	1.OA.A.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1	1.OA.A.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1	1.NBT.B.2	Understand that the two digits of a two-digit number represent amounts of tens and ones.
1	1.NBT.B.3	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
1	1.M.A.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
1	1.M.A.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
1	1.DL.A.1	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
1	1.G.A.1	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
1	1.G.A.2	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
2	2.OA.A.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2	2.NBT.A.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
2	2.NBT.A.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
2	2.NBT.B.5	With accuracy and efficiency, add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2	2.M.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2	2.M.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2	2.M.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.

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GRADE	CODE	STANDARD
2	2.DL.B.3	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
2	2.DL.B.4	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.
2	2.G.A.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2	2.G.A.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
3	3.OA.A.1	Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.
3	3.OA.A.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
3	3.OA.A.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
3	3.OA.B.5	Apply properties of operations as strategies to multiply and divide.
3	3.NF.A.1	Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.
3	3.NF.A.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3	3.M.B.3	Recognize area as an attribute of plane figures and understand concepts of area measurement.
3	3.M.B.4	Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).
3	3.DL.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
3	3.DL.B.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
3	3.G.A.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

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ENGLISH LANGUAGE ARTS

41 STANDARDS

Based on the New Jersey state standards

GRADE	CODE	STANDARD
K	L.RF.K.1.C	Understand that words are separated by spaces in print.
K	L.RF.K.2.A	Recognize and produce rhyming words.
K	L.RF.K.3.B	Associate the long and short sounds with the common spellings (graphemes) for the five major vowels.
K	L.RF.K.3.C	Read high-frequency words and grade level irregular words with automaticity.
K	L.WF.K.2	Demonstrate command of the conventions of encoding and spelling common, regular, single-syllable words by: A. Representing phonemes, first to last, in simple words, using letters with a transparent relationship to sound (e.g., the "o" in "rope" may be spelled with a single letter, o). B. Writing or selecting a missing initial or final consonant when spelling a CVC (consonant-vowel-consonant) word. C. Spelling VC (vowel-consonant) [at, in] and CVC [pet, mud] words with short vowel sounds. D. Writing frequently used words accurately. E. Attempting phonetic spellings of unknown words. F. Writing initial and final consonant blends (must, slab, plump).
K	L.WF.K.3	Demonstrate command of the conventions of sentence composition.
K	L.VI.K.3.C	Identify real-life connections between words and their use (e.g., note places at school that are colorful).
K	SL.II.K.2	Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
K	SL.UM.K.5	Add drawings or other visual displays to descriptions as desired to provide additional detail.
1	L.RF.1.2.A	Distinguish long from short vowel sounds in spoken single-syllable words.
1	L.RF.1.2.C	Isolate and pronounce initial, medial vowel, and final sounds (phonemes) in spoken single-syllable words.
1	L.RF.1.3	Know and apply grade-level phonics and word analysis skills in decoding words.
1	L.RF.1.3.B	Decode regularly spelled one-syllable words.
1	L.RF.1.3.C	Know final -e and common vowel team conventions for representing long vowel sounds.
1	L.RF.1.3.D	Distinguish long and short vowels when reading regularly spelled one-syllable words.
1	L.RF.1.3.F	Read high-frequency and grade-level irregular words with automaticity (e.g. fly, walk, old).
1	L.RF.1.4	Read with sufficient accuracy and fluency to support comprehension.
1	L.WF.1.2	Demonstrate command of the conventions of encoding and spelling common, regular, single-syllable words (including those proficiencies listed in L.WF.K.2) with: A. Short vowels and single consonants. B. Consonant graphemes including qu, x, and –ck; digraphs (thin, shop, when, much, sing); and doubled letters (off, will, mess). C. Initial and final consonant blends (must, slab, plump).

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GRADE	CODE	STANDARD
1	L.WF.1.3	Demonstrate command and use of the conventions of writing, (including those proficiencies listed in L.WF.K.3): A. Write sentences with increasing complexity. B. Supply the "who," "is doing," "what," in a subject-verb-object sentence frame. C. Capitalize the first word of a sentence, days of the week, months, names of people, and proper names. D. Match periods, question marks, and exclamation points to statements, questions, commands, and exclamations. E. Use commas in dates and to separate single words in a series. F. Distinguish between a complete sentence and a sentence fragment and supply the missing phrase or clause. G. Write statements in response to questions, and questions transformed from statements, using conventional word order. H. Elaborate a simple subject or simple predicate, in response to questions who, what, where, when, how, or why. I. Use conjunctions appropriately in sentences (e.g., and, but, so, and because).
1	SL.II.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
1	SL.PI.1.4	Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
2	L.RF.2.3.A	Know spelling-sound correspondences for common vowel teams.
2	L.WF.2.3.F	Use an apostrophe to form contractions and frequently occurring possessives.
2	L.VL.2.2.A	Use sentence-level context as a clue to the meaning of a word or phrase.
2	L.VI.2.3.A	Identify real-life connections between words and their use (e.g., describe foods that are spicy or juicy).
2	W.AW.2.1	With prompts and support, write opinion pieces to present an idea with reasons or information.
2	W.NW.2.3	Write narratives based on real or imagined experiences or events with basic story elements.
2	W.WP.2.4	With guidance and support from adults and peers, develop and strengthen writing as needed by planning, revising and editing.
2	SL.PE.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.
2	SL.II.2.2	Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
2	SL.PI.2.4	Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.
2	SL.UM.2.5	Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
3	L.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding and encoding words.
3	L.WF.3.3.D	Use common regular and irregular plural forms, writing nouns and verbs that agree in number.
3	L.VL.3.2	Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

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GRADE	CODE	STANDARD
3	L.VI.3.3	Demonstrate understanding of figurative language, word relationships and nuances in word meanings.
3	RL.CR.3.1	Ask and answer questions and make relevant connections to demonstrate understanding of a literary text, referring explicitly to textual evidence as the basis for the answers.
3	RL.CI.3.2	Recount in oral and written form key details from a text and explain how they support the theme (in literary texts, e.g., fables, folktales, and myths from diverse cultures).
3	W.NW.3.3	Write narratives to develop real or imagined experiences or events with basic story elements.
3	W.WP.3.4	With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
3	SL.II.3.2	Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

COMPUTER SCIENCE AND DESIGN THINKING

12 STANDARDS

Based on the New Jersey state standards

GRADE	CODE	STANDARD
K–2	8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
K–2	8.1.2.CS.2	Explain the functions of common software and hardware components of computing systems.
K–2	8.1.2.IC.1	Compare how individuals live and work before and after the implementation of new computing technology.
K–2	8.1.2.AP.1	Model daily processes by creating and following algorithms to complete tasks.
K–2	8.1.2.AP.3	Create programs with sequences and simple loops to accomplish tasks.
K–2	8.1.2.AP.4	Break down a task into a sequence of steps.
K–2	8.1.2.AP.5	Describe a program's sequence of events, goals, and expected outcomes.
K–2	8.1.2.AP.6	Debug errors in an algorithm or program that includes sequences and simple loops.
3	8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
3	8.1.5.AP.1	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
3	8.1.5.AP.3	Create programs that include sequences, events, loops, and conditionals.
3	8.1.5.AP.6	Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.

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SCIENCE

5 STANDARDS

Based on the New Jersey state standards

GRADE	CODE	STANDARD
K–2	K-2-ETS1-1	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.
K–2	K-2-ETS1-2	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.
K–2	K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
3	3-5-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.
3	3-5-ETS1-3	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 New Jersey, as published by the New Jersey 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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- A lesson-level crosswalk is available on request at info@truerobotics.org.

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