PAVING THE WAY WITH TREADS

GRADES K–3

This document lists the Maryland 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 Maryland State Department of Education and the NGSS Lead States, as adopted by Maryland.

42	38	18	5	103
MATH	ELA	CS	SCIENCE	TOTAL STANDARDS

MATHEMATICS

42 STANDARDS

Based on the Maryland state standards

GRADE	CODE	STANDARD
K–3	SMP 1	Make sense of problems and persevere in solving them
K	K.NOS.A.1	Count to 100 by ones and by tens.
K	K.NOS.B.6	Use the relationship between numbers and quantities within 20 to count objects with one-to-one correspondence (arranged in a line, a rectangular array, a circle, or as many as 10 things in scatter configuration) and verbalize that the last number stated is the total when asked "how many?" (cardinality).
K	K.NOS.B.7	When counting objects within 20, recognize that each successive number name refers to a quantity that is one larger.
K	K.AT.A.1	Represent addition and subtraction situations (presented with numerals or mathematical symbols) within 10 with objects, fingers, drawings, sounds (e.g., claps), acting out situations, using verbal explanations, and/or writing expressions and equations.
K	K.AT.A.2	Solve addition and subtraction problems in context (add to, take from, put together/take apart) within 10 and represent by using objects, drawings, and/or equations.
K	K.GR.A.1	Describe measurable attributes of an object such as length, height, weight, and capacity using appropriate vocabulary (e.g. long, short, tall, heavy, light, wide, narrow, full, empty).
K	K.GR.A.2	Directly compare two objects with a measurable attribute in common, using words such as "greater/less," "more/fewer," "longer/shorter," "lighter/heavier," or "taller/shorter."
K	K.GR.B.4	Describe the relative positions of objects using terms such as above, below, beside, in front of, behind, and next to.
K	K.GR.B.5	Identify and describe given shapes and shapes of objects in everyday situations including two-dimensional shapes (circle, triangle, rectangle, square, hexagon) and three-dimensional shapes (cone, cube, cylinder, and sphere) regardless of their orientation or overall size.

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GRADE	CODE	STANDARD
K	K.DS.A.1	Organize data by classifying objects into given categories and counting the number of objects in each category (Limit the total in any one category to maximum of 20).
K	K.DS.A.2	Analyze data sets by ordering the categories by count.
1	SMP 2	Reason abstractly and quantitatively
1	1.NOS.B.3	Extend understanding of 10 as a group, collection, or bundle of ten ones, called a "ten," to compose and decompose two-digit numbers.
1	1.NOS.B.5	Compare two numbers within 100 by reasoning about values of tens and ones digits and the location of the numbers on a number line. Record the results of comparisons with the symbols >, =, and <.
1	1.AT.A.2	Add and subtract within 20 involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions (result unknown, change unknown, start unknown) by using objects, drawings, and/or equations with a symbol for the unknown number to represent the problem.
1	1.GR.A.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
1	1.GR.A.2	Use non-standard units (with no gaps or overlaps) to measure the length of an object to the nearest whole unit.
1	1.GR.B.3	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size).
1	1.GR.B.4	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.
1	1.DS.A.1	Ask and answer questions by collecting, organizing and summarizing data.
2	2.NOS.A.1	Use understanding of 100 as a bundle of ten tens, called a "hundred," and compose and decompose three-digit numbers.
2	2.NOS.A.3	Read and write numbers within 1000 using base-ten numerals, number names, and expanded form.
2	2.NOS.C.8	Fluently add and subtract within 100.
2	2.NOS.D.11	Partition circles and rectangles into equal shares (halves, thirds, and fourths) recognizing that equal shares do not need to have the same shape. Determine how many equal shares are needed to make a whole (e.g., three thirds).
2	2.AT.A.1	Use addition and subtraction within 100 to solve one-step problems in context involving an unknown in any situation or position by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
2	2.AT.A.2	Use addition and/or subtraction within 100 to solve two-step problems in context involving an unknown in any situation or position by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
2	2.GR.A.1	Measure the length of an object to the nearest whole unit by using appropriate tools (e.g., rulers, yardsticks, meter sticks, and measuring tapes).
2	2.GR.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.

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GRADE	CODE	STANDARD
2	2.GR.B.5	Identify and draw shapes (triangles, quadrilaterals, pentagons, hexagons, and cubes) having specific attributes, such as a given number of angles or a given number of equal faces.
2	2.GR.C.9	Count mixed sets of coins and bills to solve problems in context (within $20.00) involving bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.
2	2.DS.A.1	Ask and answer questions by collecting, organizing and summarizing data.
3	3.NOS.B.2	Represent and interpret multiplication of two factors (0-10) as equal groups or as a composed unit that can be repeated/iterated. Explain the relationship between the factors and products.
3	3.NOS.C.4	Identify and apply the Commutative Property of Multiplication, Associative Property of Multiplication, and Distributive Property of Multiplication as strategies to multiply.
3	3.NOS.C.5	Explain and use the inverse relationship between multiplication and division to determine the unknown whole number in a multiplication or division equation involving three whole numbers (e.g., find 32 ÷ 8 by thinking of unknown-factor problem and finding the number that equals 32 when multiplied by 8).
3	3.NOS.F.10	Recognize and explain that a fraction represents a part of a whole.
3	3.NOS.F.12	Represent a fraction as a number on the number line.
3	3.AT.A.1	Use multiplication and division within 100 to solve one-step problems in context involving equal groups, arrays, and area by using concrete materials, drawings, and/or equations.
3	3.GR.A.1	Measure the length of an object to the nearest half and quarter unit by using appropriate tools (e.g., rulers, yardsticks, meter sticks, and measuring tapes).
3	3.GR.B.5	Explain 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 of shapes (e.g., quadrilaterals).
3	3.GR.C.6	Identify area as an attribute of a two-dimensional figure and measure area of rectangular space by counting square units (non-standard equal-sized units, square centimeters, square meters, square inches, square feet).
3	3.DS.A.1	Ask and answer questions by collecting, organizing and summarizing data, recognizing the importance of context when analyzing data.

ENGLISH LANGUAGE ARTS: READING FOUNDATIONAL SKIL

38 STANDARDS

Based on the Maryland state standards

GRADE	CODE	STANDARD
K	RF.K.1c	Understand that words are separated by spaces in print.
K	RF.K.2a	Recognize and produce rhyming words.
K	RF.K.2e	Isolate and pronounce the initial, medial vowel, and final sounds (phonemes) in three phoneme (consonant-vowel-consonant, or CVC) words.
K	RF.K.3c	Associate the long and short sounds with common spellings (graphemes) for the five major vowels.

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GRADE	CODE	STANDARD
K	RF.K.3e	Read common high-frequency words by sight.
K	SL.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.K.5	Add drawings or other visual displays to descriptions as desired to provide additional detail.
K	L.K.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
K	L.K.5c	Identify real-life connections between words and their use (e.g., note places at school that are colorful).
1	RF.1.2b	Distinguish long from short vowel sounds in single syllable words
1	RF.1.3	Know and apply phonics and word analysis skills in reading (decoding) and writing (encoding) words.
1	RF.1.3c	Know and apply phonics skills to decode and encode one-syllable words.
1	RF.1.3d	Read high-frequency words by sight.
1	RF.1.4	Read grade-appropriate texts with sufficient accuracy, rate, and prosody to support comprehension.
1	SL.1.2	Ask and answer questions about key details in a text read aloud, or information presented orally or through other media
1	SL.1.4	Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
1	L.1.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
2	RF.2.3a	Know and apply phonics skills to read (decode) and write (encode) one syllable words.
2	L.2.1a	Use collective nouns (e.g., group)
2	L.2.1b	Form and use frequently occurring irregular plural nouns (e.g., feet, children, teeth, mice, fish).
2	L.2.2c	Use an apostrophe to form contractions and frequently occurring possessives.
2	L.2.4a	Use sentence-level context as a clue to the meaning of a word or phrase.
2	L.2.5a	Identify real-life connections between words and their use (e.g., describe foods that are spicy or juicy).
2	W.2.1	Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section.
2	W.2.3	Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.
2	W.2.5	With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.

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GRADE	CODE	STANDARD
2	SL.2.1c	Ask for clarification and further explanation as needed about the topics and texts under discussion.
2	SL.2.2	Recount or describe key ideas or details from a text read aloud, or information presented orally or through other media.
2	SL.2.4	Tell a story or recount an experience with appropriate facts and relevant descriptive details, speaking audibly in coherent sentences.
2	SL.2.5	Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
3	RF.3.3	Know and apply phonics and word analysis skills in reading (decoding) and writing (encoding) words.
3	L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 3 reading and content, choosing flexibly from an array of strategies.
3	L.3.5	Demonstrate understanding of word relationships and nuances in word meanings.
3	RL.3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
3	RL.3.2	Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.
3	SL.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.
3	W.3.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
3	W.3.5	With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.

COMPUTER SCIENCE

18 STANDARDS

Based on the Maryland state standards

GRADE	CODE	STANDARD
K–3	5.d	Students: understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.
K–3	6.c	Students: communicate complex ideas clearly and effectively by creating or using a variety of digital content such as visualizations, models or simulations
K–2	2.b	Students: engage in positive, safe, legal and ethical behavior when using technology and online social interactions
K	K.CS.D.01	Select and operate the appropriate computing device to perform a variety of different tasks
K	K.AP.A.01	Model daily processes and follow basic algorithms (step-by-step lists of instructions) to complete tasks.

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GRADE	CODE	STANDARD
K	K.AP.C.01	With guidance, create a set of instructions (programs) to accomplish a task using a programming language, device, or unplugged activity, including sequencing, emphasizing the beginning, middle, and end.
K	K.IC.C.01	Use grade-level appropriate language to identify and describe how people use a variety of technologies and applications in their daily work and personal lives.
1	1.CS.D.01	Select and operate the appropriate application/software to perform a variety of tasks or obtain a desired outcome.
1	1.AP.A.01	Model daily processes and follow basic algorithms (step-by-step lists of instructions) to complete tasks verbally, kinesthetically, via a programming language, or using a device.
2	2.DA.S.01	Create, copy, manipulate, and delete a file on a computing device. Identify the information stored as data
2	2.AP.A.01	Model daily processes by creating and following algorithms (step-by-step lists of instructions) to complete tasks verbally, kinesthetically, via a programming language, or using a device.
2	2.AP.C.01	Create programs using a programming language, robot device, or unplugged activity that utilize sequencing and repetition to solve a problem or express creative ideas.
3	3.DA.CVT.01	Collect, organize, and present the same data in a variety of visual formats (e.g., charts, graphs, tables, etc.).
3	3.AP.A.01	Develop and compare multiple algorithms for the same task.
3	3.AP.C.01	Create programs using a programming language that includes sequences, loops, conditionals, and variables to solve a problem or express an idea.
3	3.AP.PD.03	Analyze and debug an existing program or algorithm that includes sequencing, repetition, and variables in a programming language.
3	1.d	Students: understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.
3	7.b	Students: use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints

SCIENCE

5 STANDARDS

Based on the Maryland 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.

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GRADE	CODE	STANDARD
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 Maryland, as published by the Maryland State Department of Education and the NGSS Lead States, as adopted by Maryland.
- 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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