

PAVING THE WAY WITH TREADS

GRADES K-3

This document lists the Alaska 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 Alaska Department of Education & Early Development.

42

MATH

40

ELA

17

CS

5

SCIENCE

104

TOTAL STANDARDS

MATHEMATICS

42 STANDARDS

Based on the Alaska state standards

GRADE	CODE	STANDARD
K-3	MP.1	Make sense of problems and persevere in solving them.
K	K.CC.1	Count to 100 by ones and by tens.
K	K.CC.4	Understand the relationship between numbers and quantities; connect counting to cardinality.
K	K.OA.1	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps) acting out situations, verbal explanations, expressions, or equations.
K	K.OA.2	Add or subtract whole numbers to 10 (e.g., by using objects or drawings to solve word problems).
K	K.MD.1	Describe measurable attributes of objects (e.g., length or weight). Match measuring tools to attribute (e.g., ruler to length). Describe several measurable attributes of a single object.
K	K.MD.2	Make comparisons between 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.MD.3	Classify objects into given categories (attributes). Count the number of objects in each category (limit category counts to be less than or equal to 10).
K	K.G.1	Describe objects in the environment using names of shapes and describe their relative positions (e.g., above, below, beside, in front of, behind, next to).
K	K.G.2	Name shapes regardless of their orientation or overall size.
1	MP.2	Reason abstractly and quantitatively.

GRADE	CODE	STANDARD
1	1.OA.1	Use addition and subtraction strategies to solve word problems (using numbers up to 20), involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, using a number line (e.g., by using objects, drawings and equations). Record and explain using equation symbols and a symbol for the unknown number to represent the problem.
1	1.OA.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). Record and explain using equation symbols and a symbol for the unknown number to represent the problem.
1	1.NBT.2	Model and identify place value positions of two digit numbers.
1	1.NBT.3	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, $<$.
1	1.MD.1	Measure and compare three objects using standard or non-standard units.
1	1.MD.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.
1	1.MD.7	Organize, represent and interpret data with up to three categories. Ask and answer comparison and quantity questions about the data.
1	1.G.1	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes. Identify shapes that have non-defining attributes (e.g., color, orientation, overall size). Build and draw shapes given specified attributes.
1	1.G.2	Compose (put together) two-dimensional or three-dimensional shapes to create a larger, composite shape, and compose new shapes from the composite shape.
2	2.OA.1	Use addition and subtraction strategies to estimate, then solve one- and two-step word problems (using numbers up to 100) 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). Record and explain using equation symbols and a symbol for the unknown number to represent the problem.
2	2.NBT.1	Model and identify place value positions of three digit numbers.
2	2.NBT.3	Read, write, order up to 1000 using base-ten numerals, number names and expanded form.
2	2.NBT.5	Fluently add and subtract using numbers up to 100.
2	2.MD.1	Measure the length of an object by selecting and using standard tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2	2.MD.3	Estimate, measure and draw lengths using whole units of inches, feet, yards, centimeters and meters.
2	2.MD.8	Solve word problems involving dollar bills and coins using the \$ and ¢ symbols appropriately.
2	2.MD.9	Collect, record, interpret, represent, and describe data in a table, graph or line plot.
2	2.MD.10	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.

GRADE	CODE	STANDARD
2	2.G.1	Identify and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces compared visually, not by measuring. Identify triangles, quadrilaterals, pentagons, hexagons and cubes.
2	2.G.3	Partition circles and rectangles into 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.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.3	Use multiplication and division numbers up to 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.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
3	3.OA.5	Make, test, support, draw conclusions and justify conjectures about properties of operations as strategies to multiply and divide.
3	3.NF.1	Understand a fraction $1/b$ (e.g., $1/4$) as the quantity formed by 1 part when a whole is partitioned into b (e.g., 4) equal parts; understand a fraction a/b (e.g., $2/4$) as the quantity formed by a (e.g., 2) parts of size $1/b$. (e.g., $1/4$)
3	3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3	3.MD.4	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.MD.5	Measure and record lengths using rulers marked with halves and fourths of an inch. Make a line plot with the data, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
3	3.MD.7	Recognize area as an attribute of plane figures and understand concepts of area measurement.
3	3.MD.8	Measure areas by tiling with unit squares (square centimeters, square meters, square inches, square feet, and improvised units).
3	3.G.1	Categorize shapes by different attribute classifications and recognize that shared attributes can define a larger category. Generalize to create examples or non-examples.

ENGLISH LANGUAGE ARTS

40 STANDARDS

Based on the Alaska 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.3b	Associate the long and short sounds with the common spellings (graphemes) for the five major vowels.

GRADE	CODE	STANDARD
K	RF.K.3c	Read common high-frequency words by sight. (e.g., the, of, to, you, she, my, is, are, do, does).
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 details.
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.1.2a	Distinguish long from short vowel sounds in spoken single-syllable words.
1	RF.1.2c	Isolate and pronounce initial, medial vowel, and final sounds (phonemes) in spoken single-syllable words.
1	RF.1.3	Know and apply grade-level phonics and word analysis skills in decoding words.
1	RF.1.3b	Decode regularly spelled one-syllable words.
1	RF.1.3c	Know final -e and common vowel team conventions for representing long vowel sounds.
1	RF.1.3g	Recognize and read grade-appropriate irregularly spelled words.
1	RF.1.4	Read with sufficient accuracy and fluency 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	Distinguish long and short vowels when reading regularly spelled one-syllable words.
2	RF.2.3b	Know spelling-sound correspondences for additional common vowel teams.
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 one or more concluding sentences that restate or paraphrase their opinion.
2	W.2.3	Use narrative writing to retell a well-elaborated event or short sequence of real or imagined events, include details to describe actions, thoughts, and feelings, use linking words to signal event order, and provide one or more concluding sentences that restate or emphasize a feeling or lesson learned.
2	W.2.5	With guidance and support from adults and peers, focus on a topic and strengthen writing as needed (e.g., adding concrete and sensory details; elaborating on how the details chosen support the focus) by revising and editing.

GRADE	CODE	STANDARD
2	SL.2.1c	Ask for clarification and further explanation as needed about the topics and texts under discussions.
2	SL.2.2	Retell 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 retell an experience with relevant 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.
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).
3	RL.3.1	Ask and answer questions to demonstrate understanding of a text (e.g., making basic inferences and predictions), referring explicitly to details from the text as the basis for the answers.
3	RL.3.2	Determine the author's purpose, message, lesson, or moral and explain how it is conveyed through key details in the text; summarize stories in correct sequence, including fables and folktales from diverse cultures.
3	RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
3	W.3.3	Use narrative writing to develop real or imagined characters, experiences, or events using effective narrative techniques (dialogue, description, elaboration, problem-solution, figurative language), and clear event sequences (chronology).
3	W.3.5	With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
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	L.3.4	Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.
3	L.3.5	Demonstrate understanding of word relationships and nuances in word meanings.

COMPUTER SCIENCE

17 STANDARDS

Based on the Alaska state standards

GRADE	CODE	STANDARD
K-2	K-2.DC.2	With guidance from an educator, students understand how to be careful when using devices and how to be safe online, follow safety rules when using the internet and collaborate with others.
K-2	K-2.CC.2	Students use digital tools to create original works.
K-2	K-2.CC.4	With guidance from an educator, students select technology to share their ideas with different people.
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 programming language.
1	1.CS.D.01	With guidance, select and use a computing device to perform a variety of tasks for an intended outcome.
1	1.CGEI.C.01	Identify how people use many types of technologies in their daily work and personal lives.
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 programming language.
2	2.AP.C.01	With guidance, create programs using a programming language, robot device or unplugged activity that utilize sequencing and repetition to solve a problem or express ideas both independently and collaboratively.
2	2.AP.PD.03	Independently and collaboratively, create and debug programs, which include sequencing and repetition to accomplish tasks as a means of creative expression or problem solving using a programming language and/or unplugged activities.
3	3.DA.CVT.01	Collect and organize data in a spreadsheet.
3	3.AP.A.01	Create and follow algorithms to accomplish a simple task or solve a simple problem
3	3.AP.M.01	Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.
3	3.AP.PD.01	Outline problems and potential solutions using a sequence of steps and conditional logic (e.g., if-then-else statements).
3	3-5.CT.4	Students understand and explore basic concepts related to automation, patterns and algorithmic thinking.
3	3-5.CC.3	Students create digital artifacts to communicate ideas visually and graphically.
3	3-5.GC.1	Students use digital tools to work with friends and people from different backgrounds or cultures.

SCIENCE (ENGINEERING DESIGN)

5 STANDARDS

Based on the Alaska 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 and discuss 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 Alaska, as published by the Alaska Department of Education & Early Development.
- 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.