

PAVING THE WAY WITH TREADS

GRADES K-3

This document lists the Ohio 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 Ohio Department of Education and Workforce.

42

MATH

41

ELA

21

CS

5

SCIENCE

109

TOTAL STANDARDS

MATHEMATICS

42 STANDARDS

Based on the Ohio 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 using a variety of objects including pennies.
K	K.OA.1	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds such as claps, acting out situations, verbal explanations, expressions, or equations.
K	K.OA.2	Solve addition and subtraction problems (written or oral), and add and subtract within 10 by using objects or drawings to represent the problem.
K	K.MD.1	Identify and describe measurable attributes (length, weight, and height) of a single object using vocabulary terms such as long/short, heavy/light, or tall/short.
K	K.MD.2	Directly compare two objects with a measurable attribute in common to see which object has "more of" or "less of" the attribute, and describe the difference.
K	K.MD.3	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. The number of objects in each category should be less than or equal to ten. Counting and sorting coins should be limited to pennies.
K	K.G.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.2	Correctly name shapes regardless of their orientations or overall size.
1	MP.2	Reason abstractly and quantitatively.

GRADE	CODE	STANDARD
1	1.OA.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.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.2	Understand that the two digits of a two-digit number represent amounts of tens and ones.
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 $>$, $=$, and $<$.
1	1.MD.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
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. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
1	1.MD.4	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.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 that possess defining attributes.
1	1.G.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.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.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.3	Read and write numbers to 1,000 using base-ten numerals, number names, expanded form, and equivalent representations, e.g., 716 is $700 + 10 + 6$, or $6 + 700 + 10$, or 6 ones and 71 tens, etc.
2	2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2	2.MD.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2	2.MD.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2	2.MD.8	Solve problems with money.

GRADE	CODE	STANDARD
2	2.MD.9	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 creating a line plot, where the horizontal scale is marked off in whole number units.
2	2.MD.10	Organize, represent, and interpret data with up to four categories; complete picture graphs when single-unit scales are provided; complete bar graphs when single-unit scales are provided; solve simple put-together, take-apart, and compare problems in a graph.
2	2.G.1	Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.
2	2.G.3	Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, or fourths and quarters, and use the phrases half of, third of, or fourth of and quarter of. Describe the whole as two halves, three thirds, or four fourths in real-world contexts. 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 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.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
3	3.OA.5	Apply properties of operations as strategies to multiply and divide.
3	3.NF.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.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3	3.MD.3	Create scaled picture graphs to represent a data set with several categories. Create scaled bar graphs to represent a data set with several categories. Solve two-step "how many more" and "how many less" problems using information presented in the scaled graphs.
3	3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by creating a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
3	3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement.
3	3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
3	3.G.1	Draw and describe triangles, quadrilaterals (rhombuses, rectangles, and squares), and polygons (up to 8 sides) based on the number of sides and the presence or absence of square corners (right angles).

ENGLISH LANGUAGE ARTS

41 STANDARDS

Based on the Ohio 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 common spellings (graphemes) for the five major vowels.
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 in various media and other formats (e.g., orally) 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.1.2a	Distinguish long from short vowel sounds in spoken single-syllable words.
1	RF.1.2c	Isolate and pronounce initial, medial vowel, and final 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 in various media and other formats (e.g., orally).
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 that introduce the topic or book being written about, express 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.

GRADE	CODE	STANDARD
2	W.2.3	Write narratives to 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.
2	SL.2.1c	Ask for clarification and further explanation as needed about the topics and texts under discussion.
2	SL.2.2	Retell or describe key ideas or details from a text read aloud or information presented in various media and other formats (e.g., orally).
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.
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, referring explicitly to the text as the basis for the answers.
3	RL.3.2a	Determine a theme and explain how it is conveyed through key details in the text.
3	RL.3.2b	Retell stories, including fables, folktales, and myths from diverse cultures.
3	RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
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.
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 & TECHNOLOGY

21 STANDARDS

Based on the Ohio state standards

GRADE	CODE	STANDARD
K-2	K-2.DC.2.b	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.6.b	Students use digital tools to create original works.
K-2	K-2.CC.6.d	With guidance from an educator, students select technology to share their ideas with different people.
K	ATP.A.K.a	With guidance and support, model a real-world process by constructing and following step-by-step directions (i.e., algorithms) to complete tasks.
K	ATP.CS.K.a	With guidance and support, model a sequence of instructions (i.e., program) with a beginning, middle and end to solve a problem or express an idea.
1	CS.D.1.a	Operate commonly used devices and their components to perform a variety of tasks.
1	ATP.A.1.a	With guidance, model a real-world process by constructing and following step-by-step directions (i.e., algorithms) to complete tasks.
1	ATP.PD.1.a	With guidance, plan and create an artifact to illustrate thoughts, ideas and problems in a sequential (step-by-step) manner (e.g., story map, storyboard, sequential graphic organizer).
1	IC.Cu.1.b	Identify how people use and are impacted by many types of technologies in their daily work and personal lives.
2	ATP.CS.2.a	Develop a program that uses sequencing and repetition (i.e., loops) to solve a problem or express ideas.
2	ATP.PD.2.b	Identify and fix (i.e., debug) a multi-step process that includes sequencing.
3	CS.HS.3.a	Identify and use digital learning tools/devices to support planning, implementing and reflecting upon a defined task.
3	DA.DCS.3.a	Collect quantitative data over time from multiple sources to perform various tasks.
3	DA.VC.3.a	Create a chart or graph to inform a target audience about observations and data collected.
3	ATP.A.3.a	Construct and reflect on errors in an algorithm to accomplish a given task.
3	ATP.CS.3.a	Create a program using sequences, events, loops and conditionals to solve a problem.
3	ATP.PD.3.b	Using a given program known to contain errors, identify and debug errors to ensure it works.
3	3-5.CT.5.c	Students break down problems into smaller parts, identify key information, and propose solutions.
3	3-5.CT.5.d	Students understand and explore basic concepts related to automation, patterns, and algorithmic thinking.
3	3-5.CC.6.c	Students create digital artifacts to communicate ideas visually and graphically.

GRADE	CODE	STANDARD
3	3-5.GC.7.a	Students use digital tools to work with friends and people from different backgrounds or cultures.

ENGINEERING DESIGN (TECHNOLOGY STANDARDS)

5 STANDARDS

Based on the Ohio state standards

GRADE	CODE	STANDARD
K-2	K-2.ID.4.a	With guidance from an educator, students ask questions, suggest solutions, test ideas to solve problems, and share their learning.
K-2	K-2.ID.4.b	Students use age-appropriate digital and non-digital tools to design something and are aware of the step-by-step process of designing.
K-2	K-2.ID.4.c	Students use a design process to develop ideas or creations and test their designs and redesign them if necessary.
3	3-5.ID.4.a	Students explore and practice how a design process works to generate ideas, consider solutions, plan to solve a problem, or create innovative products that are shared with others.
3	3-5.ID.4.c	Students engage in a cyclical design process to develop prototypes and reflect on the role that trial and error plays.

SOURCES & NOTES

- The official mathematics, English language arts, computer science and science standards for Ohio, as published by the Ohio Department of Education and Workforce.
- 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.