

# PAVING THE WAY WITH TREADS

**GRADES K-3**

This document lists the Utah 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 Utah State Board of Education.

**47**

MATH

**37**

ELA

**14**

CS

**3**

SCIENCE

**101**

TOTAL STANDARDS

## MATHEMATICS

47 STANDARDS

Based on the Utah state standards

| GRADE    | CODE          | STANDARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>K</b> | <b>K.MP.1</b> | Make sense of problems and persevere in solving them. Explain the meaning of a problem, look for entry points to begin work on the problem, and plan and choose a solution pathway. When a solution pathway does not make sense, look for another pathway that does. Explain connections between various solution strategies and representations. Upon finding a solution, look back at the problem to determine whether the solution is reasonable and accurate, often checking answers to problems using a different method or approach. |
| <b>K</b> | <b>K.CC.1</b> | Count to 100 by ones and by tens.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>K</b> | <b>K.CC.4</b> | Understand the relationship between numbers and quantities; connect counting to cardinality.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>K</b> | <b>K.OA.1</b> | Represent addition and subtraction with objects, fingers, mental images, simple drawings, or sounds.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>K</b> | <b>K.OA.2</b> | Solve addition and subtraction word problems within 10. Use objects or drawings to represent the problem.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>K</b> | <b>K.MD.1</b> | Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>K</b> | <b>K.MD.2</b> | 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.                                                                                                                                                                                                                                                                                                                                                                                |
| <b>K</b> | <b>K.MD.3</b> | Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. Limit the category counts to less than or equal to 10.                                                                                                                                                                                                                                                                                                                                                             |
| <b>K</b> | <b>K.G.1</b>  | 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.                                                                                                                                                                                                                                                                                                                                                |

| GRADE    | CODE           | STANDARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>K</b> | <b>K.G.2</b>   | Correctly name shapes regardless of their orientations or overall sizes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1</b> | <b>1.MP.1</b>  | Make sense of problems and persevere in solving them. Explain the meaning of a problem, look for entry points to begin work on the problem, and plan and choose a solution pathway. When a solution pathway does not make sense, look for another pathway that does. Explain connections between various solution strategies and representations. Upon finding a solution, look back at the problem to determine whether the solution is reasonable and accurate, often checking answers to problems using a different method or approach. |
| <b>1</b> | <b>1.MP.2</b>  | Reason abstractly and quantitatively. Make sense of quantities and their relationships in problem situations. Contextualize quantities and operations by using images or stories. Decontextualize a given situation and represent it symbolically. Interpret symbols as having meaning, not just as directions to carry out a procedure. Know and flexibly use different properties of operations, numbers, and geometric objects.                                                                                                         |
| <b>1</b> | <b>1.OA.1</b>  | 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.                                                                                                                                                                                                                                                                                                                                               |
| <b>1</b> | <b>1.OA.2</b>  | Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1</b> | <b>1.NBT.2</b> | Understand that the two digits of a two-digit number represent amounts of tens and ones.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1</b> | <b>1.NBT.3</b> | Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$ , $=$ , and $<$ .                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1</b> | <b>1.MD.1</b>  | Order three objects by length; compare the lengths of two objects indirectly by using a third object.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>1</b> | <b>1.MD.2</b>  | 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.                                                                                                                                 |
| <b>1</b> | <b>1.MD.4</b>  | 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.                                                                                                                                                                                                                                                                                                             |
| <b>1</b> | <b>1.G.1</b>   | Distinguish between defining attributes (for example, triangles are closed and three-sided) versus non-defining attributes (for example, color, orientation, overall size); build and draw shapes that possess defining attributes.                                                                                                                                                                                                                                                                                                        |
| <b>1</b> | <b>1.G.2a</b>  | Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) to create a composite shape, and compose new shapes from the composite shape.                                                                                                                                                                                                                                                                                                                                               |
| <b>1</b> | <b>1.G.2b</b>  | Compose 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.                                                                                                                                                                                                                                                                                                                                       |

| GRADE    | CODE           | STANDARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2</b> | <b>2.MP.1</b>  | Make sense of problems and persevere in solving them. Explain the meaning of a problem, look for entry points to begin work on the problem, and plan and choose a solution pathway. When a solution pathway does not make sense, look for another pathway that does. Explain connections between various solution strategies and representations. Upon finding a solution, look back at the problem to determine whether the solution is reasonable and accurate, often checking answers to problems using a different method or approach. |
| <b>2</b> | <b>2.OA.1</b>  | 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, for example, by using drawings and equations with a symbol for the unknown number to represent the problem.                                                                                                                                                                                                                 |
| <b>2</b> | <b>2.NBT.1</b> | Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; for example, 706 equals 7 hundreds, 0 tens, and 6 ones.                                                                                                                                                                                                                                                                                                                                                                            |
| <b>2</b> | <b>2.NBT.3</b> | Read and write numbers to 1,000 using base-ten numerals, number names, and expanded form.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>2</b> | <b>2.NBT.5</b> | Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.                                                                                                                                                                                                                                                                                                                                                                            |
| <b>2</b> | <b>2.MD.1</b>  | Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>2</b> | <b>2.MD.3</b>  | Estimate lengths using units of inches, feet, centimeters, and meters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>2</b> | <b>2.MD.8</b>  | Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>2</b> | <b>2.MD.9</b>  | 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.                                                                                                                                                                                                                                                                           |
| <b>2</b> | <b>2.MD.10</b> | 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 comparison problems using information presented in a bar graph.                                                                                                                                                                                                                                                                                                               |
| <b>2</b> | <b>2.G.1</b>   | Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Sizes are compared directly or visually, not compared by measuring. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.                                                                                                                                                                                                                                                                          |
| <b>2</b> | <b>2.G.3</b>   | 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, or four fourths. Recognize that equal shares of identical wholes need not have the same shape.                                                                                                                                                                                                                                  |
| <b>3</b> | <b>3.MP.1</b>  | Make sense of problems and persevere in solving them. Explain the meaning of a problem, look for entry points to begin work on the problem, and plan and choose a solution pathway. When a solution pathway does not make sense, look for another pathway that does. Explain connections between various solution strategies and representations. Upon finding a solution, look back at the problem to determine whether the solution is reasonable and accurate, often checking answers to problems using a different method or approach. |
| <b>3</b> | <b>3.OA.1</b>  | Interpret the products of whole numbers, such as interpreting $5 \times 7$ as the total number of objects in 5 groups of 7 objects each.                                                                                                                                                                                                                                                                                                                                                                                                   |

| GRADE    | CODE           | STANDARD                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3</b> | <b>3.OA.3</b>  | Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.                                                                                                                                                                                                                                                                         |
| <b>3</b> | <b>3.OA.4</b>  | Determine the unknown whole number in a multiplication or division equation relating three whole numbers.                                                                                                                                                                                                                                                                                                           |
| <b>3</b> | <b>3.OA.5</b>  | Apply properties of operations as strategies to multiply and divide.                                                                                                                                                                                                                                                                                                                                                |
| <b>3</b> | <b>3.NF.1a</b> | Understand a fraction $1/b$ as the quantity formed by one part when a whole is partitioned into $b$ equal parts.                                                                                                                                                                                                                                                                                                    |
| <b>3</b> | <b>3.NF.1b</b> | Understand a fraction $a/b$ as the quantity formed by $a$ parts of size $1/b$ .                                                                                                                                                                                                                                                                                                                                     |
| <b>3</b> | <b>3.NF.2</b>  | Understand a fraction as a number on the number line; represent fractions on a number line diagram.                                                                                                                                                                                                                                                                                                                 |
| <b>3</b> | <b>3.MD.3</b>  | 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.                                                                                                                                                                                          |
| <b>3</b> | <b>3.MD.4</b>  | 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.                                                                                                                                                                        |
| <b>3</b> | <b>3.MD.5</b>  | Recognize area as an attribute of plane figures and understand concepts of area measurement.                                                                                                                                                                                                                                                                                                                        |
| <b>3</b> | <b>3.MD.6</b>  | Measure area by counting unit squares (square centimeters, square meters, square inches, square feet, and improvised units).                                                                                                                                                                                                                                                                                        |
| <b>3</b> | <b>3.G.1</b>   | Understand that shapes in different categories (for example, rhombuses, rectangles, and others) may share attributes (for example, having four sides), and that the shared attributes can define a larger category (for example, quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. |

## ENGLISH LANGUAGE ARTS

37 STANDARDS

Based on the Utah state standards

| GRADE    | CODE          | STANDARD                                                                                                                                                                   |
|----------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>K</b> | <b>K.SL.3</b> | Use age-appropriate language, grammar, volume, and pronunciation when speaking or presenting and use visual displays, when appropriate, to describe information to others. |
| <b>K</b> | <b>K.R.3b</b> | Demonstrate mastery of short vowel sounds (/ă/, /ĕ/, /ĭ/, /ŏ/, /ŭ/) in isolation and in VC and CVC words in single-syllable words.                                         |
| <b>K</b> | <b>K.R.3c</b> | Demonstrate mastery of long vowel sounds (/ā/, /ē/, /ī/, /ō/, /ū/) associated with single letters; open syllables in single-syllable words (e.g., be, I, no).              |
| <b>K</b> | <b>K.R.3e</b> | Read and spell common irregular words.                                                                                                                                     |
| <b>K</b> | <b>K.R.5</b>  | With prompting and support, ask and answer questions about key details in a text. (RL & RI)                                                                                |
| <b>K</b> | <b>K.W.1b</b> | Use appropriate capitalization and end punctuation.                                                                                                                        |

| GRADE    | CODE           | STANDARD                                                                                                                                                                                                                               |
|----------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | <b>1.SL.2</b>  | Speak clearly and audibly while expressing thoughts, emotions, and ideas while asking and answering questions.                                                                                                                         |
| <b>1</b> | <b>1.SL.3</b>  | Use age-appropriate language, grammar, volume, and clear pronunciation when speaking or presenting and use visual displays, when appropriate, to describe or clarify information to others.                                            |
| <b>1</b> | <b>1.R.2b</b>  | Isolate, pronounce, blend, and segment sounds in 4-5 phoneme words, including blends.                                                                                                                                                  |
| <b>1</b> | <b>1.R.2c</b>  | Distinguish long and short vowel sounds in spoken single-syllable words.                                                                                                                                                               |
| <b>1</b> | <b>1.R.3</b>   | Demonstrate mastery of age-appropriate phonics skills.                                                                                                                                                                                 |
| <b>1</b> | <b>1.R.3b</b>  | With prompting and support, identify and begin reading and spelling words with all six syllable types (i.e., open, closed, CVCe, vowel team, vowel-r, consonant -le).                                                                  |
| <b>1</b> | <b>1.R.3d</b>  | Blend words with 4-5 phonemes when reading.                                                                                                                                                                                            |
| <b>1</b> | <b>1.R.3i</b>  | Read and spell common irregular words.                                                                                                                                                                                                 |
| <b>1</b> | <b>1.R.4</b>   | Read grade-level text with accuracy and fluency to support comprehension. (RL & RI)                                                                                                                                                    |
| <b>1</b> | <b>1.R.5</b>   | Ask and answer questions about key details in a text. (RL & RI)                                                                                                                                                                        |
| <b>1</b> | <b>1.R.8</b>   | Identify specific words and phrases that express emotion, appeal to the senses, and/or determine the meaning of content-specific words within a text. (RL & RI)                                                                        |
| <b>1</b> | <b>1.W.1b</b>  | Use appropriate conventions when writing.                                                                                                                                                                                              |
| <b>2</b> | <b>2.SL.2</b>  | Speak clearly and audibly while asking and answering questions about a topic and key details.                                                                                                                                          |
| <b>2</b> | <b>2.SL.3a</b> | Present information, stories, or opinions, sequencing ideas logically and use descriptions, facts, and details.                                                                                                                        |
| <b>2</b> | <b>2.R.3a</b>  | Identify and begin reading and spelling words with all six syllable types (i.e., open, closed, CVCe, vowel team, vowel-r, consonant -le) in multisyllabic words.                                                                       |
| <b>2</b> | <b>2.R.3i</b>  | Read and spell words with the following diphthongs and vowels (i.e., oi, oy; ou, ow; au, aw; oo, u).                                                                                                                                   |
| <b>2</b> | <b>2.R.6</b>   | Read a variety of texts including those from diverse cultures, retell the narrative (RL) or informational text (RI) according to the text structure including the main idea.                                                           |
| <b>2</b> | <b>2.R.8</b>   | Explain how specific words and phrases express emotion, appeal to the senses, or determine the meaning of content-specific words within a text. (RL & RI)                                                                              |
| <b>2</b> | <b>2.R.9a</b>  | Use sentence-level context as a clue to the meaning of a word.                                                                                                                                                                         |
| <b>2</b> | <b>2.W.1</b>   | Write opinion pieces that introduce the topic, state an opinion, supply evidence that supports the opinion, use linking words to connect opinion and evidence, and provide a concluding statement.                                     |
| <b>2</b> | <b>2.W.1b</b>  | Use appropriate conventions when writing.                                                                                                                                                                                              |
| <b>2</b> | <b>2.W.3</b>   | Write narrative pieces in which they retell an elaborated event or short sequence of events; include details to describe actions, thoughts, and emotions using temporal words in sequential order; and provide a concluding statement. |
| <b>2</b> | <b>2.W.4b</b>  | Interact and collaborate with others throughout the writing process.                                                                                                                                                                   |

| GRADE    | CODE          | STANDARD                                                                                                                                                                                    |
|----------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3</b> | <b>3.SL.2</b> | Speak clearly and audibly while asking and answering questions about a topic and key details presented in various mediums and formats.                                                      |
| <b>3</b> | <b>3.R.3</b>  | Demonstrate mastery of age-appropriate phonics skills.                                                                                                                                      |
| <b>3</b> | <b>3.R.5</b>  | Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (RL & RI)                                                   |
| <b>3</b> | <b>3.R.6</b>  | Read a variety of texts including those from diverse cultures, retell the text according to the text structure including the main idea and how key details support the main idea. (RL & RI) |
| <b>3</b> | <b>3.R.8</b>  | Determine the meaning of words, phrases, similes, metaphors, and academic and content-specific words within a text. (RL & RI)                                                               |
| <b>3</b> | <b>3.R.9</b>  | Determine or clarify the meaning of unknown and multiple-meaning words and phrases choosing flexibly from a range of strategies. (RL & RI)                                                  |
| <b>3</b> | <b>3.W.3</b>  | Write narrative pieces to develop real or imagined experiences or events using effective technique, descriptive details, event sequences, and provide a concluding statement.               |
| <b>3</b> | <b>3.W.4b</b> | Interact and collaborate with others throughout the writing process.                                                                                                                        |

## COMPUTER SCIENCE

14 STANDARDS

Based on the Utah state standards

| GRADE    | CODE          | STANDARD                                                                                                                              |
|----------|---------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>K</b> | <b>K.AP.1</b> | Model processes by creating and following algorithms to complete tasks.                                                               |
| <b>1</b> | <b>1.CS.1</b> | Operate a variety of computing devices that perform tasks accurately and quickly based on user needs and preferences.                 |
| <b>1</b> | <b>1.AP.2</b> | Break down (deconstruct) algorithms and list the steps needed to solve a problem into a sequence of tasks and sub-tasks.              |
| <b>1</b> | <b>1.AP.3</b> | Create programs with sequences (steps) of commands and simple loops (repeated patterns), to express ideas or address a problem.       |
| <b>1</b> | <b>1.IC.1</b> | Develop and demonstrate the ability to work respectfully and responsibly with others whether communicating face-to-face or digitally. |
| <b>2</b> | <b>2.AP.1</b> | Deconstruct the steps needed to solve a task into a sequence of instructions.                                                         |
| <b>2</b> | <b>2.AP.2</b> | Collaboratively develop plans that describe a program's sequence of events, goals, and expected outcomes.                             |
| <b>2</b> | <b>2.IC.1</b> | Describe how technology has impacted society over time.                                                                               |
| <b>3</b> | <b>3.CS.1</b> | Describe and model how computing devices connect to other components to extend their capabilities and form a system.                  |
| <b>3</b> | <b>3.DA.1</b> | Organize and present collected data visually to highlight relationships and support a claim.                                          |
| <b>3</b> | <b>3.DA.2</b> | Use data to communicate ideas, highlight relationships, and predict outcomes.                                                         |

| GRADE    | CODE   | STANDARD                                                                                                                           |
|----------|--------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>3</b> | 3.AP.1 | Create programs that include events, sequences, loops, and simple conditionals to express ideas or address a problem.              |
| <b>3</b> | 3.AP.3 | Test and debug a program or algorithm to ensure it accomplishes the intended task.                                                 |
| <b>3</b> | 3.AP.4 | Perform different roles when collaborating with peers during the design, implementation, and review stages of program development. |

## SCIENCE WITH ENGINEERING EDUCATION (SEED)

3 STANDARDS

Based on the Utah state standards

| GRADE    | CODE  | STANDARD                                                                                                                                                                                                                                                                                       |
|----------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>K</b> | K.3.2 | Analyze data to determine how a design solution causes a change in the speed or direction of an object with a push or a pull. Define the problem by asking questions and gathering information, convey designs through sketches, drawings, or physical models, and compare and test designs.   |
| <b>1</b> | 1.3.4 | Design a device in which the structure of the device uses light or sound to solve the problem of communicating over a distance. Define the problem by asking questions and gathering information, convey designs through sketches, drawings, or physical models, and compare and test designs. |
| <b>3</b> | 3.3.5 | Design a solution to a problem in which a device functions by using scientific ideas about magnets. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution.  |

## SOURCES & NOTES

- The official mathematics, English language arts, computer science and science standards for Utah, as published by the Utah State Board 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.
- 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](mailto:info@truerobotics.org).