

# SOLARBOT™ ALIGNED TO NEXT GENERATION SCIENCE STANDARDS

## K-6

---

### KINDERGARTEN–GRADE TWO

#### K-2-ETS1 ENGINEERING DESIGN

- 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-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.

### GRADE THREE–FIVE

#### 3-5-ETS1 ENGINEERING DESIGN

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 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.
- 3-5-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.

### GRADE SIX–EIGHT

#### MS-ETS1 ENGINEERING DESIGN

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit the possible solutions.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

### KINDERGARTEN

#### K-PS2 MOTION AND STABILITY: FORCE AND INTERACTIONS

- K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
- K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or pull.

## K-LS1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

## K-ESS3 EARTH AND HUMAN ACTIVITY

- K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

## GRADE ONE

### 1-LS1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

## GRADE TWO

### 2-PS1 MATTER AND ITS INTERACTIONS

- 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

### 2-LS4 BIOLOGICAL EVOLUTION: UNITY AND DIVERSITY

- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.

## GRADE THREE

### 3-PS2 MOTION AND STABILITY: FORCES AND INTERACTIONS

- 3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- 3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

## GRADE FOUR

### 4-PS3 ENERGY

- 4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
- 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

### 4-LS1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

## GRADE FIVE

## 5-ESS3 EARTH AND HUMAN ACTIVITY

- 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

## GRADE SIX-EIGHT

### MS-PS2 MOTION AND STABILITY: FORCES AND INTERACTIONS

- MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

# SOLARBOT™ ALIGNED TO COMMON CORE STATE STANDARDS FOR MATHEMATICS K-6

---

## KINDERGARTEN

### GEOMETRY K.G

*Analyze, compare, create, and compose shapes.*

- K.G5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

## GRADE ONE

### GEOMETRY 1.G

*Reason with shapes and their attributes.*

- 1.G2. 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.

## GRADE TWO

### NUMBER AND OPERATIONS IN BASE TEN 2.NBT

*Understand place value.*

- 2.NBT3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

*Use place value understanding and properties of operations to add and subtract.*

- 2.NBT5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or relationship between addition and subtraction.

### GEOMETRY 2.G

*Reason with shapes and their attributes.*

- 2.G1. Recognize and draw shapes having specified attributes such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

## GRADE FOUR

### GEOMETRY 4.G

*Draw and identify lines and angles, and classify shapes by properties of their lines and angles.*

- 4.G1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular

and parallel lines. Identify these in two-dimensional figures.

# SOLARBOT™ ALIGNED TO COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS K-6

---

## READING STANDARDS FOR INFORMATIONAL TEXT RI

### KINDERGARTEN

- RI4. With prompting and support, ask and answer questions about unknown words in a text.
- RI7. With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).
- RI10. Actively engage in group reading activities with purpose and understanding.

### GRADE ONE

- RI4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
- RI5. Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
- RI6. Distinguish information provided by pictures or other illustrations and information provided by the words in a text.

### GRADE TWO

- RI4. Determine the meaning of words and phrases in text relevant to a *grade 2 topic or subject area*.
- RI5. Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.
- RI7. Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

### GRADE THREE

- RI4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to *grade 3 topic or subject area*.
- RI5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.
- RI7. Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

### GRADE FOUR

- RI4. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

- RI7. Interpret information presented visually, orally, or quantitatively (e.g., charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

## GRADE FIVE

- RI4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*.

## GRADE SIX

- RI4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

## READING STANDARDS: FOUNDATIONAL SKILLS RF

### KINDERGARTEN

- RF1. Demonstrate understanding of the organization and basic features of print.
  - a. Follow words from left to right, top to bottom, and page by page.
- RF3. Know and apply grade-level phonics and word analysis skills in decoding words.

### GRADE ONE

- RF1. Demonstrate understanding of the organization and basic features of print.
- RF3. Know and apply grade-level phonics and word analysis skills in decoding words.

### GRADE TWO

- RF3. Know and apply grade-level phonics and word analysis skills in decoding words.

### GRADE THREE

- RF3. Know and apply grade-level phonics and word analysis skills in decoding words.

### GRADE FOUR

- RF3. Know and apply grade-level phonics and word analysis skills in decoding words.

### GRADE FIVE

- RF3. Know and apply grade-level phonics and word analysis skills in decoding words.

## SPEAKING AND LISTENING STANDARDS SL

### KINDERGARTEN

- SL1. Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups.
  - a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about topics and texts under discussion).
- SL2. 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.

## GRADE ONE

- SL1. Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.
  - a. Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

## GRADE TWO

- SL1. Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.
  - a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL2. Recount and describe key ideas or details from a text read aloud or information presented orally or through other media.

## GRADE THREE

- SL1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
  - b. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- SL2. 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.

## GRADE FOUR

- SL1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
  - b. Follow agreed-upon rules for discussions and carry out assigned roles. .
- SL2. Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

## GRADE FIVE

- SL1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.



- b. Follow agreed-upon rules for discussions and carry out assigned roles.
- SL2. Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

## GRADE SIX

- SL1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 6 topics, texts, and issues*, building on others' ideas and expressing their own clearly.
  - b. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
- SL2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

## LANGUAGE STANDARDS L

### KINDERGARTEN

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing and speaking.
  - a. Print many upper- and lowercase letters.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *kindergarten reading and content*.
- L6. Use words and phrases acquired through conversations, reading and being read to, and responding to texts.

### GRADE ONE

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
  - a. Print all upper- and lowercase letters.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 1 reading and content*, choosing flexibly from an array of strategies.
- L6. Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using frequently occurring conjunctions to signal simple relationships (e.g., *because*).

### GRADE TWO

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases

based on *grade 2 reading and content*, choosing flexibly from an array of strategies.

- L6. Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using adjectives and adverbs to describe (e.g., *When other kids are happy that makes me happy*).

### GRADE THREE

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- L4. 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.
- L6. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., *After dinner that night we went looking for them*).

### GRADE FOUR

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 4 reading and content*, choosing flexibly from a range of strategies.
- L6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., *wildlife, conservation, and endangered when discussing animal preservation*).

### GRADE FIVE

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- L4. Determine or clarify the meaning of unknown multiple-meaning words and phrases based on *grade 5 reading and content*, choosing flexibly from a range of strategies.
- L6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., *however, although, nevertheless, similarly, moreover, in addition*).

### GRADE SIX

- L1. Demonstrate command of conventions of standard English grammar and usage when

writing or speaking.

- L3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 6 reading and content*, choosing flexibly from a range of strategies.
- L6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## READING STANDARDS FOR LITERACY IN SCIENCE AND TECHNICAL SUBJECTS RST

### GRADE SIX

- RST3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- RST4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.