LEGO® Education WeDo 2.0

Curriculum Pack Preview

Designing
Investigating
Modeling
Computing

LEGO® Education
WeDo 2.0

NATIONAL CURRICULUM STANDARD COMPLIANT

WeDo 2.0

LEGOeducation.us/WeDo

LEGO education

Table of Contents

The LEGO® Education community is an online community for teachers, administrators, and other professionals in education.
It is a place to connect and share ideas, engage in discussions, and share lesson plans and projects.
The LEGO Education community is only in English.

What's in the Curriculum Pack preview?

In this preview, you will find an overview and highlights of the WeDo 2.0 Curriculum Pack. The complete pack includes a thorough introduction to using the Core Set and Software plus 40+ hours of standards-based projects to create engaging learning experiences that make science come to life.

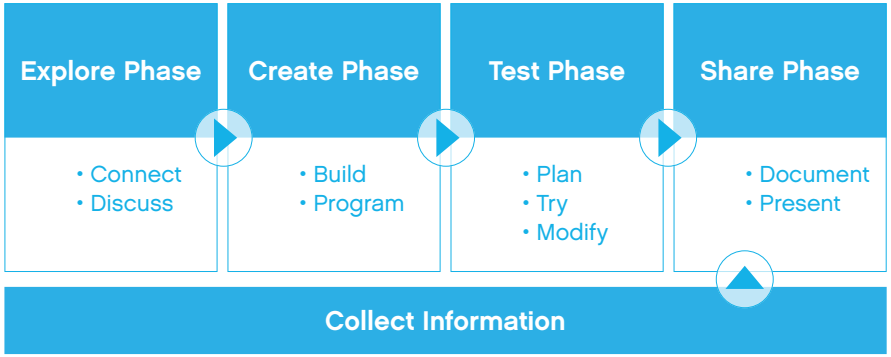
WeDo 2.0 is designed for second- through fourth-grade educators and is targeted at teaching the eight practices of science and engineering, a key component of the latest curriculum. With WeDo 2.0, your students will explore, create, and share their findings as they build, program, and modify projects while working collaboratively.

With this innovative solution, you can boost your students' confidence to ask questions and solve problems by putting scientific discovery in their hands.

Use this document along with Mini Milo and the software to experience how WeDo 2.0 can help you meet curriculum objectives across science, engineering, technology, and coding.

Project Progression with WeDo 2.0

WeDo 2.0 uses a project progression that is defined by four phases. These phases are explained below, and the illustration to the right shows the steps that are associated with each phase.



Explore Phase
In this phase, students connect to a scientific question or an engineering problem, establish a line of inquiry, and consider possible solutions.

Create Phase
During the Create phase, students build and program a LEGO® model.

Test Phase
In this phase, students are given tasks that will encourage them to modify their LEGO model. Each WeDo 2.0 project focuses on one of three types of activities: investigation, designing solutions, or using models. The Test phase will differ from one project to another based on the type of project that is being done.

Share Phase
During the Share phase of the project, students present and explain their solutions using their LEGO models and the digital portfolio they have created using the integrated Documentation tool.

Important

During each of these phases, the students will use various methods to document their findings, solutions, and process. This digital portfolio can be exported and used for assessment, display, or sharing with parents.

Document projects

Having your students document their work in digital portfolios is one of the many ways you can keep track of their work, identify where they need more help, and evaluate their progress.

Students can use many different methods to express their ideas. During the ongoing documentation process, they can:

1. Take pictures of important steps of their prototype or their final models.
2. Take pictures of the team working on something important.
3. Record a video explaining a problem they are facing.
4. Record a video explaining their investigation.
5. Write critical information within the Documentation tool.
6. Find supporting pictures on the Internet.
7. Take a screen capture of their program.
8. Write, draw, or sketch on paper and take a photo of it.

Suggestion

Depending on the age group you work with, a combination of paper and digital documentation can be the richest.

Share projects

At the end of the project, students will be excited to share their solutions and findings. It will be a great opportunity to develop their communication ability.

Here are different ways you can have your students share their work:

1. Have students create the display where the LEGO® model will be used.
2. Have students describe their investigation or diorama.
3. Have a team of students present their best solution to you, to another team, or in front of the class.
4. Have an expert (or some parents) come to your class to listen to your students.
5. Organize a science fair at your school.
6. Have students record a video to explain their project and post it online.
7. Create and display posters of the projects in your school.
8. E-mail the project document to parents or publish in student portfolios.

Suggestion

To make this experience even more positive, have students give one positive comment or ask one question about others' work when they take part in the sharing session.

Create phase

Build and program Milo.
Students should follow the building instructions to build Milo, the Science Rover.

1. **Build Milo, the Science Rover.**
   This model will give students a "first build" experience with WeDo 2.0.

Important

Make sure everyone can connect the motor to the Smarthub and can connect the Smarthub to the device.

2. **Program Milo.**
   This program will start the motor at power 8, go in one direction for 2 seconds, and then stop.

The motor can be started in both directions, stopped and turned at different speeds, and activated for a specific amount of time (specified in seconds).

Suggestion

Give students time to change the parameters of this program string. Let them discover new features, such as adding sound.

Use this opportunity to guide students to the Design Library so they can gain inspiration about other program strings they can explore.

Share phase

Present

- Before you move on to the next part of the Getting Started Project, allow the students to express themselves.
- Have a short discussion with your students about scientific and engineering instruments.
- Have your students describe how science rovers are helpful to humans.
- Ask you students to share their solution to the problem or their experiences while completing the project.

Document

- Have students discover the use of the Documentation tool.
- Have them take a team picture with their model.

Want to see more of the WeDo 2.0 Curriculum?

Visit LEGOeducation.com/downloads to access the curriculum pack and eLearning programs.

Develop science and engineering practices with WeDo 2.0

WeDo 2.0 projects will develop science practices. They provide opportunities for students to work with and develop ideas and knowledge as well as an understanding of the world around them.

The progression and di culty level in the projects allow students to develop competency while exploring and learning about key science topics. The projects have been carefully chosen to cover a wide variety of topics and issues.

WeDo 2.0 projects develop eight science and engineering practices:
1. Ask questions and solve problems.
2. Use models.
3. Design prototypes.
4. Investigate.
5. Analyze and interpret data.
6. Use computational thinking.
7. Engage in argument from evidence.
8. Obtain, evaluate, and communicate information.

The guiding principle is that every student should engage in all of these practices across the projects in each grade.

Visual overview of Guided Projects

1. Pulling
Investigate the effects of balanced and unbalanced forces on the movement of an object.

2. Speed
Investigate what factors can make a car go faster to help predict future motion.

3. Robust Structures
Investigate what characteristics of a building would help make it resistant to an earthquake using an earthquake simulator constructed from LEGO® bricks.

4. Frog's Metamorphosis
Model a frog's metamorphosis using a LEGO representation, and identify the characteristics of the organism at each stage.

5. Plants and Pollinators
Model a LEGO representation of the relationship between a pollinator and flower during the reproduction phase.

6. Prevent Flooding
Design an automatic LEGO floodgate to control water according to various precipitation patterns.

7. Drop and Rescue
Design a device to reduce the impacts on humans, animals, and the environment after an area has been damaged by a weather-related hazard.

8. Sort to Recycle
Design a device to use physical properties of objects, including their shape and size, to sort them.

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Visual overview of Open Projects

9. Predator and Prey
Model a LEGO® representation of the behaviors of several predators and their prey.

10. Animal Expression
Model a LEGO representation of various communication methods in the animal kingdom.

11. Extreme Habitats
Model a LEGO representation of the influence of the habitat on the survival of some species.

12. Space Exploration
Design a LEGO prototype of a rover that would be ideal for exploring distant planets.

13. Hazard Alarm
Design a LEGO prototype of a weather alarm device to reduce the impact of severe storms.

14. Cleaning the Ocean
Design a LEGO prototype to help people remove plastic waste from the ocean.

15. Wildlife Crossing
Design a LEGO prototype to allow an endangered species to safely cross a road or other hazardous area.

16. Moving Materials
Design a LEGO prototype of a device that can move specific objects in a safe and efficient way.

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Curriculum overview of Guided Projects organized by NGSS disciplinary core ideas

	1 Pulling	2 Speed	3 Robust Structures	4 Frog's Metamor-phosis	5 Plants and Pollinators	6 Prevent Flooding	7 Drop and Rescue	8 Sort to Recycle
Life Sciences				3-LS1-1 3-LS3-1 3-LS3-2	2-LS2-2 4-LS1-1			
Earth and Space Sciences			4-ESS3-2			2-ESS2-1 3-ESS3-1 3-ESS2-1 4-ESS2-2	3-ESS3-1	2-PS1-1
Physical Sciences	3-PS2-1	3-PS2-2 4-PS3-1						
Engineering, Technology, and Applications of Science	3-5-ETS-1-2		3-5-ETS-4-3			3-5-ETS-1-2	3-5-ETS-1-2	K-2-ETS-1-2

Curriculum overview of Open Projects organized by NGSS disciplinary core ideas

	9 Predator and Prey	10 Animal Expression	11 Extreme Habitats	12 Space Exploration	13 Hazard Alarm	14 Cleaning the Ocean	15 Wildlife Crossing	16 Moving Materials
Life Sciences	3-LS4-3	3-LS4-2 4-PS4-3 4-LS1-2	2-LS4-1 3-LS3-2 3-LS4-1				2-LS4-1 3-LS4-4	
Earth and Space Sciences					3-ESS3-1			
Physical Sciences								2-PS1-3
Engineering, Technology, and Applications of Science				3-5-ETS1-2 3-5-ETS1-3	3-5-ETS1-2	3-5-ETS1-1 3-5-ETS1-2	K-2-ETS1-1 K-2-ETS1-3	K-2-ETS1-2

NGSS performance expectations: Grade 2

Life science

2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

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

Physical science

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

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-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a wholly new object.

2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

Earth and space science

2-ESS1-1. Use information from several sources to provide evidence that earth events can occur quickly or slowly.

2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the physical shape of the land.

2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area.

2-ESS2-3. Obtain information to identify where water is found on earth and understand that it can be solid or liquid.

Engineering

K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change in order to define a simple problem that can be solved through the development of a new or improved object or tool.

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 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.

NGSS performance expectations: Grade 3

Physical science

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.

3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.

Earth and space science

3-ESS2-1. Represent data in tables and graphic displays to describe typical weather conditions expected during a particular season.

3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.

3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Engineering

3-5-ETS1-1. Define a simple design problem reflecting a need 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 meets 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.

Life science

3-LS2-1. Construct an argument that some animals from groups that help members survive.

3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4. Make a claim about the merit of a solution to a problem that is caused when the environment changes and the types of plants and animals that live there may also change.

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

NGSS performance expectations: Grade 4

Energy

4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.

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-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.

4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

4-ESS3-1. Obtain and combine information to describe the fact that energy and fuels are derived from natural resources and that their use will affect the environment.

Structure, function, and information processing

4-PS4-2. Develop a model to describe how light reflecting from objects and entering the eye of a sighted person allows objects to be seen.

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

4-LS1-2. Use a model to describe how animals receive different types of information through their senses, then process the information in their brain, and respond to the information in a range of different ways.

Waves: Waves and information

4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

4-PS4-3. Generate and compare multiple solutions that use patterns for the transfer of information.

Earth's systems: Processes that shape the earth

4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-2. Analyze and interpret data from maps to describe patterns of earth's features.

4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural earth processes on humans.

Engineering

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

3-5-ETS1-2. Generate and compare 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.

Computational Thinking in Curriculum

The world is changing, and whether we realize it or not, technology and computer science shape nearly every aspect of our lives. Students are rapidly becoming active citizens, and equipping them with the right set of skills has become one of the nation's first priorities.

Computational thinking is a set of skills that is spreading worldwide, becoming a key practice to develop in relation to technology. Already identified by the NGSS as a practice essential to the Science and Engineering field, computational thinking has found roots in many other national curriculums both domestically and abroad.

Computational thinking has become the foundation of standards issued by the Computer Science Teacher Association (CSTA) and other associations such as ISTE, Code.org, and Computing at School (the British association responsible for a globally recognized computing curriculum). All of these organizations have aligned their curriculums with an emphasis on the development of computational thinking skills.

These important skills can be developed through engaging activities or projects that are rooted in real life problem-based situations. To support this development, LEGO® Education is adding a dedicated series of computational thinking projects to the science projects that are already available in WeDo 2.0.

Visual Overview of Guided Projects

1. Moon Base
This project is about designing a solution in which a robot would be able to assemble a base on the moon.

2. Grabbing Objects
This project is about designing a solution for a prosthetic arm that is able to move small objects around.

3. Send Messages
This project is about designing a solution for exchanging information using a system of signals organized in patterns.

4. Volcano Alert
This project is about designing a device for improving the monitoring of volcanic activity in order to guide scientific exploration.

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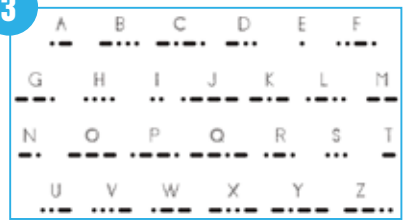

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Visual Overview of Open Projects

5. Inspection
This project is about designing a solution in which a robot is able to inspect narrow spaces, guiding its motion with sensors.

6. Emotional Design
This project is about designing a solution in which a robot can display positive emotions when interacting with people.

7. City Safety
This project is about designing a solution to improve safety in a city.

8. Animal Senses
This project is about modeling how animals use their senses to interact with their environment.

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Curriculum Overview of Guided Projects Organized by NGSS Disciplinary Core Ideas

	1 Moon Base	2 Grabbing Objects	3 Send Messages	4 Volcano Alert
Life Sciences				
Earth and Space Sciences				4-ESS3-2.
Physical Sciences			4-PS4-3.	
Engineering, Technology, and Applications of Science	K-2-ETS1-3. 3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.	3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.	3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.	3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.

Curriculum Overview of Open Projects Organized by NGSS Disciplinary Core Ideas

	5 Inspection	6 Emotional Design	7 City Safety	8 Animal Senses
Life Sciences				4-LS1-2.
Earth and Space Sciences				
Physical Sciences				
Engineering, Technology, and Applications of Science	K-2-ETS1-3. 3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.	K-2-ETS1-3. 3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.	K-2-ETS1-3. 3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.	K-2-ETS1-3. 3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.

NGSS Performance Expectations: Grade Two

Life Science

2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

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

Physical Science

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

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-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a wholly new object.

2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

Earth and Space Science

2-ESS1-1. Use information from several sources to provide evidence that earth events can occur quickly or slowly.

2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the physical shape of the land.

2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area.

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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 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.

NGSS Performance Expectations: Grade Three

Physical Science

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.

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NGSS Performance Expectations: Grade Four

Energy

4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.

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-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.

4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

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Engineering

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

3-5-ETS1-2. Generate and compare possible solutions to a problem based on how well each meets 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.

Curriculum Overview of Guided and Open Projects Organized by CSTA Standards

Identifier		Interim CSTA K–12 CS Standard	1 Moon Base	2 Grabbing Objects	3 Send Messages	4 Volcano Alert	5 Inspection	6 Emotional Design	7 City Safety	8 Animal Senses
K–2	1A-A-3-7	Construct and execute algorithms (sets of step-by-step instructions) that include sequencing and simple loops to accomplish a task, both independently and collaboratively, with or without a computing device.	●	●	●	●	●	●	●	●
K–2	1A-A-6-8	Analyze and debug (fix) an algorithm that includes sequencing and simple loops, with or without a computing device.	●	●	●	●	●	●	●	●
K–2	1A-C-7-9	Identify and use software that controls computational devices (e.g., use an app to draw on the screen, use software to write a story or control robots).	●	●	●	●	●	●	●	●
K–2	1A-C-7-10	Use appropriate terminology in naming and describing the function of common computing devices and components (e.g., desktop computer, laptop computer, tablet device, monitor, keyboard, mouse, printer).								
K–2	1A-C-6-11	Identify, using accurate terminology, simple hardware and software problems that may occur during use (e.g., app or program not working as expected, no sound, device won't turn on).	●	●	●	●	●	●	●	●
K–2	1A-D-7-12	Collect data over time and organize it in a chart or graph in order to make a prediction.								
K–2	1A-D-4-13	Use a computing device to store, search, retrieve, modify, and delete information and define the information stored as data.								
K–2	1A-D-4-14	Create a model of an object or process in order to identify patterns and essential elements (e.g., water cycle, butterfly life cycle, seasonal weather patterns).	●	●	●	●	●	●	●	●

Curriculum Overview of Guided and Open Projects Organized by CSTA Standards

Identifier		Interim CSTA K–12 CS Standard	1 Moon Base	2 Grabbing Objects	3 Send Messages	4 Volcano Alert	5 Inspection	6 Emotional Design	7 City Safety	8 Animal Senses
3–5	1B-A-2-1	Apply collaboration strategies to support problem solving within the design cycle of a program.	●	●	●	●	●	●	●	●
3–5	1B-A-7-2	Use proper citations and document when ideas are borrowed and changed for their own use (e.g., using pictures created by others, using music created by others, remixing programming projects).	●	●	●	●	●	●	●	●
3–5	1B-A-5-3	Create a plan as part of the iterative design process, both independently and with diverse collaborative teams (e.g., storyboard, flowchart, pseudocode, story map).	●	●	●	●	●	●	●	●
3–5	1B-A-5-4	Construct programs, in order to solve a problem or for creative expression, that includes sequencing, events, loops, conditionals, parallelism, and variables, using a block-based visual programming language or text-based language, both independently and collaboratively (e.g., pair programming).	●	●	●	●	●	●	●	●
3–5	1B-A-5-5	Use mathematical operations to change a value stored in a variable.				●				
3–5	1B-A-3-6	Decompose (break down) a larger problem into smaller sub-problems, independently or in a collaborative group.	●	●	●	●	●	●	●	●

Curriculum Overview of Guided and Open Projects Organized by CSTA Standards

Identifier		Interim CSTA K–12 CS Standard	1 Moon Base	2 Grabbing Objects	3 Send Messages	4 Volcano Alert	5 Inspection	6 Emotional Design	7 City Safety	8 Animal Senses
3–5	1B-A-3-7	Construct and execute an algorithm (set of step-by-step instructions) that includes sequencing, loops, and conditionals to accomplish a task, both independently and collaboratively, with or without a computing device.	●	●	●	●	●	●	●	●
3–5	1B-A-6-8	Analyze and debug (fix) an algorithm that includes sequencing, events, loops, conditionals, parallelism, and variables.	●	●	●	●	●	●	●	●
3–5	1B-C-7-9	Model how a computer system works.(Clarification: only includes basic elements of a computer system, such as input, output, processor, sensors, and storage.)								
3–5	1B-C-7-10	Use appropriate terminology in naming internal and external components of computing devices and describing their relationships, capabilities, and limitations.								
3–5	1B-C-6-11	Identify, using accurate terminology, simple hardware and software problems that may occur during use, and apply strategies for solving problems (e.g., reboot device, check for power, check network availability, close and reopen app).								
3–5	1B-D-5-12	Create a computational artifact to model the attributes and behaviors associated with a concept (e.g., solar system, life cycle of a plant).	●	●	●	●	●	●	●	●
3–5	1B-D-5-13	Answer a question by using a computer to manipulate (e.g., sort, total and/or average, chart, graph) and analyze data that has been collected by the class or student.								

Curriculum Overview of Guided and Open Projects Organized by CSTA Standards

Identifier		Interim CSTA Standard	1 Moon Base	2 Grabbing Objects	3 Send Messages	4 Volcano Alert	5 Inspection	6 Emotional Design	7 City Safety	1 Animal Senses
3–5	1B-D-4-14	Use numeric values to represent non-numeric ideas in the computer (binary, ASCII, pixel attributes such as RGB).			●					
3–5	1B-I-7-15	Evaluate and describe the positive and negative impacts of the pervasiveness of computers and computing in daily life (e.g., downloading videos and audio files, electronic appliances, wireless internet, mobile computing devices, GPS systems, wearable computing).								
3–5	1B-I-7-16	Generate examples of how computing can affect society, and also how societal values can shape computing choices.								
3–5	1B-I-1-17	Seek out and compare diverse perspectives, synchronously or asynchronously, to improve a project.								
3–5	1B-I-1-18	Brainstorm ways in which computing devices could be made more accessible to all users.								
3–5	1B-I-1-19	Explain problems that relate to using computing devices and networks (e.g., logging out to deter others from using your account, cyberbullying, privacy of personal information, and ownership).								
3–5	1B-N-7-20	Create examples of strong passwords, explain why strong passwords should be used, and demonstrate proper use and protection of personal passwords.								
3–5	1B-N-4-21	Model how a device on a network sends a message from one device (sender) to another (receiver) while following specific rules.			●					

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