STEAM – Unit 1(ROBOTICS)

Content Area: **Robotics (Grade 3rd)**
Course(s):
Time Period: **Ongoing**
Length: **Ongoing**
Status: **Published**

Big Idea

Students understand that a robot is a machine that collects information from its surroundings. It uses that information to follow instructions and to complete a task. Today's Robots have multiple sensors and are able to make their own decisions based on given information. Robots come in all shapes and sizes. The jobs they do are also varied. Some robots are used in factories. Others are experimental robots that use artificial intelligence. Artificial intelligence allows robots to behave more like human beings and to act independently in a changing environment. Today, robots are used by hospitals, the military, the police, the oil industry, space and ocean engineering firms, and other dangerous trades. (NASA , 2004) In the future, robots, machines, and computers will continue to replace human workers in all areas of business and industry. The effectiveness of a robot depends on the designer's ability to use computer programming language to control the robot.

Enduring Understanding

SWBAT write algorithms to control a robot's motion, sound, lights, and sensors (response to stimuli). SWBAT identify patterns in code.

Skills

- Model a toy robot to mimic the actions of one used in industry.
- Write programming to control a robot to complete a "real world" mission. For instance, students will design a police robot, a lifeguard robot, or a military robot.
- Write algorithms to control the robot's motion, sound, lights, and sensors. Practice writing sequential algorithms, debugging algorithms, looping algorithms, and creating conditional algorithms. Practice identifying patterns in code to reduce repetition and increase readability.
- Practice problem solving and perseverance techniques.

Standards

8.2.5.E.1 Identify how computer programming impacts our everyday lives.
8.2.5.E.2 Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.
8.2.5.E.3 Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output.
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8.2.5.E.4 Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, data).

Assessments

- Active participation in challenges

- Hands on learning
- Teacher observation

Resources/Instructional Materials

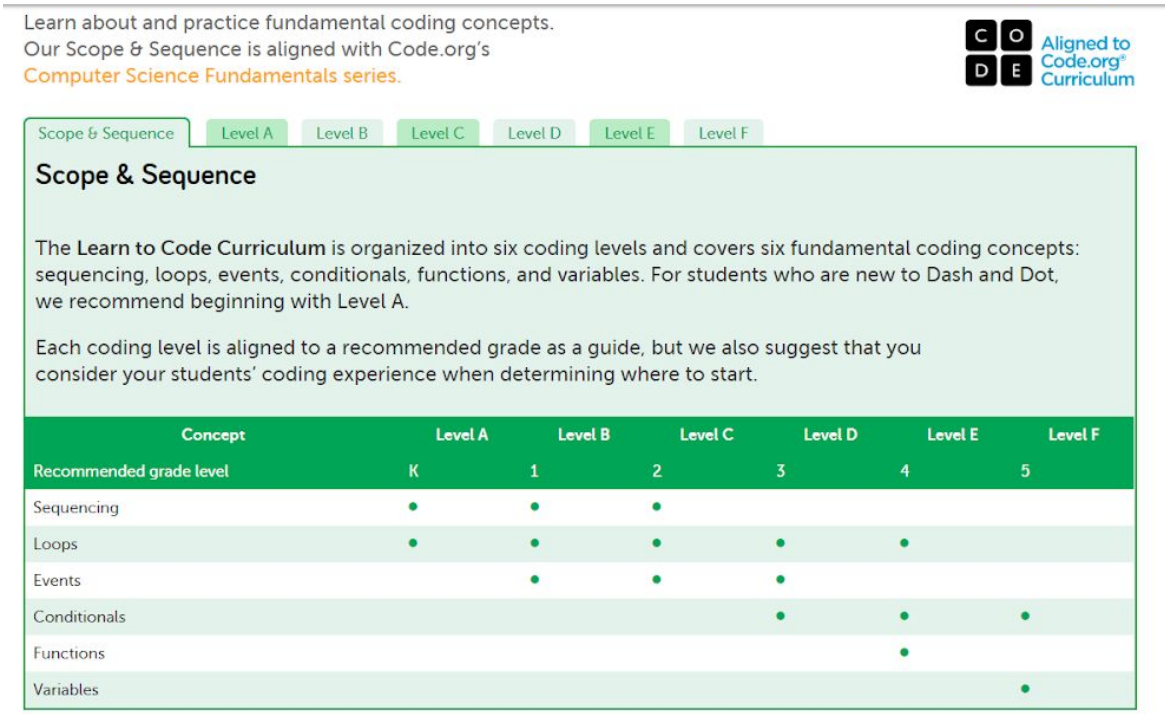
Resources/Instructional Materials

VIDEOS

Brainpop Robots
Brainpop Computer Programming
Brainpop Computers
Brainpop Assembly Line

LESSONS

Wonder Robots Dash and Dot Robotics Curriculum Pack Challenge Cards. Wonder Robots offers three apps to teach students the fundamentals of computer programming. The GO app teaches students to control the lights, sensors, sounds and motions of the robot. The PATH app introduces students to basic programming by solving linear puzzles and dragging blocks together in sequential order. The BLOCKLY app uses the most kid-friendly block-based coding on the market to introduce students to programming. Many other programming educational resources such as CODE.ORG use this format. Block programming teaches skills and lays the groundwork for learning standard programming languages such as JAVA and PYTHON. The Wonder Robots Dash and Dot Curriculum follows a scope and sequence aligned to Code.org's Computer Science Fundamental series covering the six fundamental coding concepts: sequences, loops, events, conditionals, functions, and variables across six coding levels. Students use LEARN TO CODE challenge cards to move through the concepts.



Learn about and practice fundamental coding concepts.
Our Scope & Sequence is aligned with Code.org's
Computer Science Fundamentals series.

Aligned to Code.org® Curriculum

Scope & Sequence | Level A | Level B | Level C | Level D | Level E | Level F

Scope & Sequence

The **Learn to Code Curriculum** is organized into six coding levels and covers six fundamental coding concepts: sequencing, loops, events, conditionals, functions, and variables. For students who are new to Dash and Dot, we recommend beginning with Level A.

Each coding level is aligned to a recommended grade as a guide, but we also suggest that you consider your students' coding experience when determining where to start.

Concept	Level A	Level B	Level C	Level D	Level E	Level F
Recommended grade level	K	1	2	3	4	5
Sequencing	•	•	•			
Loops	•	•	•	•	•	
Events		•	•	•		
Conditionals				•	•	•
Functions					•	
Variables						•

Modifications

Individual accommodations

• Additional support

• Adapting lessons to meet various learning styles

Integration of 21st Century Skills

Focus on the development of 21st Century Content Skills:

- Global awareness
- Civic literacy
- Health and wellness awareness
- Environmental literacy

Focus on the Development of Learning and Thinking Skills:

- Critical Thinking and Problem Solving Skills
- Communication Skills
- Creativity and Innovation Skills
- Collaboration Skills
- Information and Media Literacy Skills
- Contextual Learning Skills

Focus on the Development of Life Skills:

- Leadership
- Ethics
- Accountability
- Adaptability
- Personal Productivity
- Personal Responsibility
- People Skills
- Self Direction

- Social Responsibility

Interdisciplinary Connections

- Academic and Technical Rigor - Projects are designed to address key learning standards identified by the school or district.
- Authenticity - Projects use a real world context (e.g., community problems) and address issues that matter to the students.
- Applied Learning - Projects engage students in solving problems calling for competencies expected in high-performance work organizations (e.g.,teamwork, problem-solving, communication, etc.).
- Active Exploration - Projects extend beyond the classroom by connecting to community explorations.
- Adult Connections - Projects connect students with the wider community.
- Assessment Practices - Projects involve students in regular, performance-based exhibitions and assessments of their work; evaluation criteria reflect personal, school, and real-world standards of performance.