

KIBO Learning Objective and MA DLCS Crosswalk

Lesson	#	Learning Objective	DLCS Standard
1: Sturdy Building	1	Understand that craft and recycled materials can fit together to form sturdy structures.	N/A (engineering standard)
	2	Understand that the engineering design process is useful for planning and guiding the creation of structures.	N/A (engineering standard)
	3	Understand that there are many different kinds of engineers.	K-2.CAS.c.1: Identify and describe how people (e.g., students, parents, policemen) use many types of technologies in their daily work and personal lives.
	4	Be able to build sturdy structures	N/A (engineering standard)
	5	Be able to use the engineering design process to facilitate the creation of their structure.	K-2.CS.b.3: Recognize that different tools can solve the same problem (e.g., pen and paper, calculators, and smart phones can all be used to solve simple mathematical problems) K-2.CT.c.4: Individually and collaboratively create information visualizations (e.g., charts, infographics).
2: What is a Robot?	1	Understand that robots need moving parts, such as motors, to be able to perform behaviors specified by a program.	K-2.CS.a.2: Identify visible components of computing devices (e.g., keyboard, screen, monitor, printer, pointing device). K-2.CS.b.2: Recognize that some tasks are best completed by humans and others by computing devices (e.g., a human might be able to rescue someone in a normal environment, but robots would be better to use in a dangerous environment).
	2	Understand that the robotic 'brain' has the programmed instructions that make the robot perform its behaviors.	K-2.CS.a.3: Explain that computing devices function when applications, programs, or commands are executed. K-2.CS.b.1: Explain that computing devices are machines that are not alive, but can be used to help humans with tasks. K-2.CT.c.5: Explain that computers can save information as data that can be stored, searched, retrieved, and deleted. K-2.CT.d.1: Define a computer program as a set of commands created by people to do something.
	3	Be able to describe the components of a KIBO robot.	K-2.CAS.a.3: Care for devices appropriately (e.g., handling devices gently, completely shutting down devices when not in use, storing devices in the appropriate container). K-2.CAS.b.2: Demonstrate responsible use of computers, peripheral devices, and resources as outlined in school rules (Acceptable Use Policy [AUP] for K-2). K-2.CS.a.1: Identify different kinds of computing devices in the classroom and other places (e.g., laptops, tablets, smart phones, desktops). K-2.CS.a.2: Identify visible components of computing devices (e.g., keyboard, screen, monitor, printer, pointing device). K-2.CT.a.1: List the attributes of a common object, for example, cars have a color, type (e.g., pickup, van, sedan), number of seats, etc.
	4	Be able to scan a program onto the KIBO robot using the wooden blocks.	K-2.DTC.a.1: Operate a variety of digital tools (e.g., open/close, find, save/print, navigate, use input/output devices). K-2.CS.a.4: Operate a variety of computing systems (e.g., turn on, use input/output devices such as a mouse, keyboard, or touch screen; find, navigate, launch a program).
	5	Be able to build sturdy, robotic vehicles that move.	N/A (engineering standard)

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3: Hokey Pokey	1	Understand that each icon or “block” corresponds to a specific instruction.	K-2.CS.a.3: Explain that computing devices function when applications, programs, or commands are executed. K-2.CT.b.1: Define an algorithm as a sequence of defined steps. K-2.CT.b.3: Enact an algorithm using tangible materials (e.g., manipulatives, your body) or present the algorithm in a visual medium (e.g., storyboard). K-2.CT.d.2: Explain that computers only follow the program’s instructions.
	2	Understand that a program is a sequence of instructions that is followed by a robot.	K-2.CS.a.3: Explain that computing devices function when applications, programs, or commands are executed. K-2.CT.b.1: Define an algorithm as a sequence of defined steps. K-2.CT.b.3: Enact an algorithm using tangible materials (e.g., manipulatives, your body) or present the algorithm in a visual medium (e.g., storyboard). K-2.CT.d.1: Define a computer program as a set of commands created by people to do something. K-2.CT.d.2: Explain that computers only follow the program’s instructions.
	3	Understand that the order of the instructions dictates the order in which the robot executes the instructions.	K-2.CS.a.3: Explain that computing devices function when applications, programs, or commands are executed. K-2.CT.b.2: Create a simple algorithm, individually and collaboratively, without using computers to complete a task (e.g., making a sandwich, getting ready for school, checking a book out of the library). K-2.CT.d.2: Explain that computers only follow the program’s instructions.
	4	Be able to point out or select the appropriate block corresponding to a planned robot action	K-2.CT.b.2: Create a simple algorithm, individually and collaboratively, without using computers to complete a task (e.g., making a sandwich, getting ready for school, checking a book out of the library). K-2.CT.c.4: Individually and collaboratively create information visualizations (e.g., charts, infographics).
	5	Be able to connect a series of wooden KIBO blocks	K-2.DTC.a.3: Create a simple digital artifact. K-2.CT.d.3: Individually or collaboratively create a simple program using visual instructions or tools that do not require a textual programming language (e.g., “unplugged” programming activities, a block-based programming language).
	6	Be able to scan a program onto the robot	K-2.DTC.a.1: Operate a variety of digital tools (e.g., open/close, find, save/print, navigate, use input/output devices). K-2.CS.a.4: Operate a variety of computing systems (e.g., turn on, use input/output devices such as a mouse, keyboard, or touch screen; find, navigate, launch a program). K-2.CT.c.5: Explain that computers can save information as data that can be stored, searched, retrieved, and deleted. K-2.CT.d.3: Individually or collaboratively create a simple program using visual instructions or tools that do not require a textual programming language (e.g., “unplugged” programming activities, a block-based programming language).
	7	Be able to fix the sequence as they see it doesn’t work (debugging)	3-5.CT.b.5 Detect and correct logical errors in various algorithms (e.g., written, mapped, live action, or digital). 3-5.CT.d.3 Use interactive debugging to detect and correct simple program errors.
4: What are	1	Understand that an instruction or sequence of instructions may be modified to repeat.	K-2.CT.b.1: Define an algorithm as a sequence of defined steps.
	2	Understand that some programming instructions, like ‘Repeat,’ can be qualified with additional information called parameters.	3-5.CT.d.2 Use arithmetic operators, conditionals, and repetition in programs. [Gr 3-5 standard] 3-5.CT.d.4 Recognize that programs need known starting values (e.g., set initial score to zero in a game). [Gr 3-5 standard]
	3	Be able to recognize a situation that requires a loop.	3-5.CT.d.2 Use arithmetic operators, conditionals, and repetition in programs. [Gr 3-5 standard]

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Repeats?	4	Be able to make a program that loops with the "Repeat" block.	K-2.CT.d.3: Individually or collaboratively create a simple program using visual instructions or tools that do not require a textual programming language (e.g., "unplugged" programming activities, a block-based programming language). 3-5.CT.d.2 Use arithmetic operators, conditionals, and repetition in programs. [Gr 3-5 standard]
	5	Be able to use number parameters to modify the number of times a loop runs.	3-5.CT.d.2 Use arithmetic operators, conditionals, and repetition in programs. [Gr 3-5 standard] 3-5.CT.d.4 Recognize that programs need known starting values (e.g., set initial score to zero in a game). [Gr 3-5 standard]
5: What are Sensors? (Part 1)	1	Understand that a robot can sense its surroundings with a sensor.	K-2.CT.e.1: Describe how models represent a real-life system (e.g., globe, map, solar system, digital elevation model, weather map). 3-5.CS.a.2 Describe the function and purpose of various input and output devices (e.g., monitor, keyboard, speakers, controller, probes, sensors, Bluetooth transmitters, synthesizers). [Gr 3-5 standard]
	2	Understand that there are different kinds of sensors.	K-2.CS.a.1: Identify different kinds of computing devices in the classroom and other places (e.g., laptops, tablets, smart phones, desktops). K-2.CS.a.2: Identify visible components of computing devices (e.g., keyboard, screen, monitor, printer, pointing device). 3-5.CS.a.2 Describe the function and purpose of various input and output devices (e.g., monitor, keyboard, speakers, controller, probes, sensors, Bluetooth transmitters, synthesizers). [Gr 3-5 standard]
	3	Be able to use a sound sensor with KIBO	3-5.CS.a.3 Demonstrate an appropriate level of proficiency (connect and record data, print, send command, connect to Internet, search) in using a range of computing devices (e.g., probes, sensors, printers, robots, computers). [Gr 3-5 standard]
	4	Be able to program with the Wait For Clap Block	K-2.CT.d.3: Individually or collaboratively create a simple program using visual instructions or tools that do not require a textual programming language (e.g., "unplugged" programming activities, a block-based programming language). 3-5.CS.a.3 Demonstrate an appropriate level of proficiency (connect and record data, print, send command, connect to Internet, search) in using a range of computing devices (e.g., probes, sensors, printers, robots, computers). [Gr 3-5 standard]
	5	Be able to compare and contrast human senses and robot sensors	K-2.CS.b.2: Recognize that some tasks are best completed by humans and others by computing devices (e.g., a human might be able to rescue someone in a normal environment, but robots would be better to use in a dangerous environment).
6: What are Sensors? (Part 2)	1	Understand that a robot can sense its surroundings with a sensor.	K-2.CT.e.1: Describe how models represent a real-life system (e.g., globe, map, solar system, digital elevation model, weather map).
	2	Understand that a robot can react to collected data by changing its behavior.	K-2.CT.c.1: Identify different kinds of information (e.g., text, charts, graphs, numbers, pictures, audio, video, collections of objects.)
	3	Understand that certain instructions (like "Repeat") can be modified with sensor data.	3-5.CT.d.2 Use arithmetic operators, conditionals, and repetition in programs. [Gr 3-5 standard] 3-5.CS.a.2 Describe the function and purpose of various input and output devices (e.g., monitor, keyboard, speakers, controller, probes, sensors, Bluetooth transmitters, synthesizers). [Gr 3-5 standard]
	4	Be able to use distance and light sensors with KIBO	3-5.CS.a.3 Demonstrate an appropriate level of proficiency (connect and record data, print, send command, connect to Internet, search) in using a range of computing devices (e.g., probes, sensors, printers, robots, computers). [Gr 3-5 standard]

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	5	Be able to compare and contrast human senses and robot sensors	K-2.CS.b.2: Recognize that some tasks are best completed by humans and others by computing devices (e.g., a human might be able to rescue someone in a normal environment, but robots would be better to use in a dangerous environment).
	6	Be able to program with the Until Near/Far and Until Light/Dark parameters for the Repeat block	K-2.CT.d.3: Individually or collaboratively create a simple program using visual instructions or tools that do not require a textual programming language (e.g., “unplugged” programming activities, a block-based programming language). 3-5.CS.a.3 Demonstrate an appropriate level of proficiency (connect and record data, print, send command, connect to Internet, search) in using a range of computing devices (e.g., probes, sensors, printers, robots, computers). [Gr 3-5 standard]
7: What are “ifs”?	1	Understand that a robot can change its behavior depending on information from a sensor.	K-2.CT.c.1: Identify different kinds of information (e.g., text, charts, graphs, numbers, pictures, audio, video, collections of objects.)
	2	Be able to identify a situation that needs a branched program.	3-5.CT.d.2 Use arithmetic operators, conditionals, and repetition in programs. [Gr 3-5 standard]
	3	Be able to make a program that uses a branch.	3-5.CT.d.2 Use arithmetic operators, conditionals, and repetition in programs. [Gr 3-5 standard]
	4	Be able to program with the Near/Far and Light/Dark parameters for the If block.	K-2.CT.d.3: Individually or collaboratively create a simple program using visual instructions or tools that do not require a textual programming language (e.g., “unplugged” programming activities, a block-based programming language). 3-5.CS.a.3 Demonstrate an appropriate level of proficiency (connect and record data, print, send command, connect to Internet, search) in using a range of computing devices (e.g., probes, sensors, printers, robots, computers). [Gr 3-5 standard]
8: Final Project	1	Create a final project integrating robotics with a cross-curricular subject	(This unit is the application of the objectives in lessons 1-7.) K-2.DTC.a.4: Use appropriate digital tools individually and collaboratively to create, review, and revise simple artifacts that include text, images and audio. K-2.DTC.b.1: Collaboratively use digital tools and media resources to communicate key ideas and details in a way that informs, persuades, and/or entertains.
	2	Share and discuss the design process	K-2.DTC.b.3: Use a variety of digital tools to present information to others. K-2.DTC.c.2: Create an artifact individually and collaboratively that answers a research question, while clearly expressing thoughts and ideas. K-2.CT.c.2: Identify, research, and collect information on a topic, issue, problem, or question using age-appropriate digital technologies. K-2.CT.c.3: Individually and collaboratively propose a solution to a problem or question based on an analysis of information.
	3	Share and discuss the final project	K-2.CT.c.4: Individually and collaboratively create information visualizations (e.g., charts, infographics). K-2.CT.e.1: Describe how models represent a real-life system (e.g., globe, map, solar system, digital elevation model, weather map). K-2.CT.e.2: Define simulation and identify the concepts illustrated by a simple simulation (e.g., growth and health, butterfly life cycle).