

Connecting to the *Next Generation Science Standards* (NGSS Lead States 2013):

Standard K-2 LS1-1 From Molecules to Organisms: Structures and Processes https://www.nextgenscience.org/dci-arrangement/1-ls1-molecules-organisms-structures-and-processes The materials/lessons/activities outlined in this article are intended for use in pre-K classrooms. Science experiences in pre-K by their nature are foundational and relate to early elements in learning progressions that facilitate later learning in K-12 classrooms. As the NGSS performance expectations are for K-12, we have not included specific performance expectations but have identified the disciplinary core ideas that are addressed to show the link between these foundational experiences and students' later learning. Performance Expectation: K-2 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.	
Dimension	Connections to Classroom Activity
Science and Engineering Practice	
Constructing Explanations and Designing Solutions	Students identified a destination to help an animal-like robot meet a need for food or water and then programmed the robot to reach the destination. Students described how they sequenced a robot's movement to solve a problem.
Disciplinary Core Idea	
LS1.A: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.	Students identified parts of robots that enabled them to move. Students compared the structure and function of parts of animal-like robots with the structure and function of parts of animal bodies.

Crosscutting Concept	
Structure and Function: The shape and stability of natural and designed objects are related to their function(s).	Students applied principles of structure, function, and biomimicry to design and tell stories about robots.
Influence of Science, Engineering, and Technology on Society and the Natural World	
Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world.	Students designed robots and described how their robots might potentially impact society.

Connections to the *Common Core State Standards* (NGAC and CCSSO 2010):

ELA CCSS.ELA-LITERACY.L.K.6 Use words and phrases acquired through conversations, reading and being read to, and responding to texts. CCSS.ELA-LITERACY.L.K.1.F Produce and expand complete sentences in shared language activities.	Students used words and phrases to complete sentences about robot paths and activities.
Mathematics Describe and compare measurable attributes. Analyze, compare, create, and compose shapes. Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Attend to precision. Look for and make use of structure.	Students used numbers to program robots. Students used estimation, comparison, and mathematical reasoning to command and control robots.