

Communicating Reasons, Arguments and Ideas - Engaging in Arguing from Evidence

<p>4.1.1 Students will be able to engage in argument from evidence for the explanations the students construct, defend and revise their interpretations when presented with new evidence, critically evaluate the scientific arguments of others, and present counter arguments.</p>	
K	<p>0P.4.1.1.1 Construct an argument supported by evidence for whether a design solution works as intended to change the speed or direction of an object with a push or a pull.* Examples of problems requiring a solution may include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions may include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.</p>
1	<p>1E.4.1.1.1 Construct an argument based on observational evidence for how plants and animals (including humans) can change the non-living aspects of the environment to meet their needs. Examples of plants and animals changing their environment may include a squirrel digging in the ground to hide its food and tree roots breaking concrete.</p>
2	<p>2L.4.1.1.1 Construct an argument with evidence that evaluates how in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. (P: 7, CC: 2, CI: LS4, ETS2) Emphasis is on the interdependence of parts of a system (organisms and their habitat). Examples of habitats should include those found in Minnesota, such as a wetland, prairie, or garden. Examples of evidence may include needs and characteristics of the organisms and habitats involved.</p>
3	<p>3L.4.1.1.1 Construct an argument about strategies animals use to survive. Emphasis is on group behavior and how being part of a group helps animals obtain food, defend themselves, and cope with changes. Examples of animals should include wolves or other animals that live in Minnesota.</p>
4	<p>4L.4.1.1.1 Construct or support an argument that traits can be influenced by different environments. Emphasis of the practice is on using evidence, data and/or a model to support an argument. Examples of the environment affecting a trait may include the stunted growth of a typically tall plant grown with insufficient water or an animal's weight being influenced by the availability of food.</p>
5	<p>5E.4.1.1.1 Use evidence to support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth. Evidence may include analogies of light bulbs and distances.</p>

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4.1.2 Students will be able to argue from evidence to justify the best solution to a problem or to compare and evaluate competing designs, ideas, or methods.*	
1	1E.4.1.2.1 Construct an argument with evidence to evaluate multiple solutions designed to slow or prevent wind or water from changing the shape of the land.* Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water; and different designs for using shrubs, grass, and trees to hold back the land.
5	5L.4.1.2.1 Evaluate the merit of a solution to a problem caused by changes in plant and animal populations as a result of environmental changes.* Emphasis is on evaluating solutions (based on evidence and design criteria and constraints), not developing new solutions. Examples of environmental changes may include land characteristics, water distribution, temperature, food availability, or the presence of other organisms.