

Busy Beavers: An Engineering Design Challenge

Grade Levels: 4-6

Program Description:

Beavers are often called “nature’s engineers” due to their remarkable ability to change their habitat. This keystone species has amazing adaptations that enable it to survive and thrive, especially in the northeast, and students may have seen evidence of beavers in their community. This lesson aims to introduce students to beaver adaptations and then focus on the engineering aspect of building dams. After learning why and how beavers build dams in the wild, students will design their own dam using provided materials, work with a team on a unifying design, and build, test, re-design, and re-test their dams.

Full program (Part 1 and 2) – 2 hours

Part 1: Beavers in the Ecosystem – 1 hour

- *focuses on the food chains, adaptations, and ecology of the beaver and explores how and why they build dams*

Part 2: Engineering Design Challenge – 1 hour

- *an engineering challenge in which the students take inspiration from the beavers and work in teams to design, test, and re-design their own dam*

Massachusetts Curriculum Standards:

Grade 4: Life Science

LS1. From Molecules to Organisms: Structures and Processes

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

Grade 5: Physical Science

ETS3. Technological Systems

5.3-5-ETS3-1(MA). Use informational text to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions). Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants.

5.3-5-ETS3-2(MA). Use sketches or drawings to show how each part of a product or device relates to other parts in the product or device.



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Grade 6: Technology/Engineering

ETS1. Engineering Design

6.MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution. Include potential impacts on people and the natural environment that may limit possible solutions.

6.MS-ETS1-5(MA). Create visual representations of solutions to a design problem. Accurately interpret and apply scale and proportion to visual representations.



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