

Building like a Beaver

Part 2: Engineering and Design

Beaver Dam Analogues

Goal: I can use and reflect on the engineering and design process to build a structure that mimics a beaver dam.

Background: To re-establish beavers and their benefits to ecosystems, humans are repopulating areas with beavers, restoring habitat, and building Beaver Dam Analogues (BDAs.) An analog is something that is comparable to something else (analogous, analogy). Humans build the structures from willow branches and posts spanning the streambed, mimicking beaver dams. BDAs are used in areas where beavers are not present, or where landowners do not want beavers, but do want healthy watersheds. Just like natural beaver dams, BDAs slow the flow of water and create habitat, helping to restore ecosystem functions.

Set-up & Materials:

- Sticks of varying sizes
- Mud or ceramic/pottery clay
- Small stones
- Rectangular tub that can hold water: plastic tubs, turkey trays
- Cup for pouring water
- Textbook or low block to be placed under one end of the tub

Criteria & Constraints:

- Your BDA must slow the flow of water
- The scale of your BDA depends on the size of the tub you use
- You may only use the materials provided
- Challenge Criteria: slow the spread of contaminants, trap sediment, slow flooding/high flows

Procedure:

1. Read through the entire handout before starting.
2. Draw a sketch of your BDA. In your sketch, label the materials used and scale.
3. Gather your materials.
4. Build your BDA according to your sketch.
5. Test your design: Pour water into one end of your tub. Observe how the water flows through your BDA. Does it move quickly/slowly/not at all? Record your observations in the Data Table.
6. Redesign: How can you improve your design? Redesign your original model to be more effective, or redesign to include the Challenge Criteria. (NOTE: even beavers redesign! Beavers rebuild their lodges EVERY year! Additionally, they

are constantly modifying and repairing their structures, just like the engineers they truly are!)

7. Test your second design. Observe how the water flows, and if applicable, the Challenge Criteria. Record your observations in the Data Table.
8. Clean-up and complete the Reflection.

Sketch: label materials and include scale

Data Table:

Test	Observations
Test 1: Original Design	
Test 2: Redesign	
Additional Notes:	

Redesign: describe how you are changing your original design and why.

I am changing my design by...

I am making these changes because...

Reflection:

Write a paragraph reflecting on your BDA using the following prompts. Use the sentence starters if you'd like.

What is a BDA? *A BDA is...*

What are some strengths of your model? *Some strengths of my model were...*

What were some weaknesses of your model? *Some weaknesses of my model were...*

How could you improve your model? *I could improve my model by...*

What questions did this activity bring up? *This activity has made me think of a new question, which is...*