

# MISSION MISSION POSSIBLE

IMAGINE. DESIGN. CREATE.



## **MISSION** : Build a Dam

Your mission is to protect a cotton ball from water... by building a dam!

### **WHAT YOU'LL NEED**

- An area you can pour water (you can use a bathtub or space outside where water will flow downward)
- Recycled material from around your house (paper, Styrofoam, cardboard, plastic, aluminum foil, mud, playdough or anything else you think will stop the water)
- Cotton balls (if you don't have cotton balls, you can use a sponge, paper towels or anything else small that will absorb water)
- A ruler, yardstick or tape measure
- Large cup
- Water
- Optional: something to write with and paper to draw on



## **LET'S READ**

Find a comfortable spot and read! Here are some ideas to get you started:

- *Building Amazing Structures: Dams* by Chris Oxlade
- *Beavers* by Melvin Berger
- *The World's Most Amazing Dams* by Ann Weil
- *Rivers* by Kay Jackson

**You can download digital copies of these books for free from [openlibrary.org](https://openlibrary.org). Here is how!**

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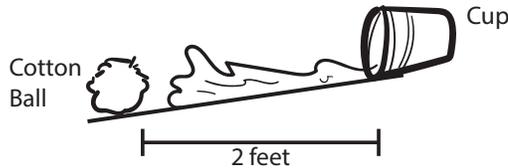
Sam Noble Home



For more activities visit [samnoblemuseum.ou.edu/samnoblehome](https://samnoblemuseum.ou.edu/samnoblehome)

## Get Started:

- 1) Pick the area where you are going to work (bathtub, driveway, etc.).
- 2) Gather the supplies and cotton balls.
- 3) In the workspace, use the ruler to measure out two feet away from the “water source” (where you will be pouring the water) and place one cotton ball there. Make sure that your cotton ball is “downhill” from the water source so that the water will flow toward the cotton ball. Fill the cup with water and pour it where you marked the “water source.” What happened?



- 4) Look at the supplies and the cotton ball:

## THINK!

- How fast did the water move?
- What direction did it flow?
- A dam is a barrier that keeps water from flowing. How can you use the materials to build a dam and stop the water from getting the cotton ball wet?
- Will you need any other materials?
- Optional: Draw what you want your design to look like!



- 5) Build it!

- 6) Once you have built your design, set another cotton ball two foot away from the water source. Pour the water again and see what happens!

## WHAT HAPPENED?

- Did your dam completely stop the water from hitting the cotton ball?
  - Did your dam break when the water hit it?
  - Did the water stay behind your dam, or go around it?
  - Did any water go underneath your dam?
- 7) Try again! Just because your idea didn't work the first time, doesn't mean you should give up. Think about how you can change your idea to build your dam in a different way so that it will better protect the cotton ball. Be creative and try as many times as you want. Ask a partner for ideas if you've tried all of yours, or check out the next page if you need some hints.

When you're done, share what you did with someone!

## TELL THEM

- Did your dam protect the cotton ball on the first try?
- How did you change your design to better stop the water?
- How many ideas did you try?
- What was hard about the challenge?
- If they wanted to try the build a dam challenge, what should they do?

## BONUS CHALLENGE

Now that you've built a dam, see if you can:

- Use twice as much water or a flowing water source (like a garden hose).
- Build a dam that changes the direction the water flows and directs it to a certain place, instead of just stopping it.
- Build a dam out of only natural things (things you find outside).

Did you know that moving water can be one of the strongest forces on earth? From raging rivers to waves in the ocean, moving water is constantly changing and shaping the world around us. While the motion of water can be very beneficial, it can also be very destructive and dangerous. Humans have used dams, or simple barriers that stop or redirect the movement of water, for thousands of years. Dams can provide water for crops, protect settlements and even provide hydroelectricity (electric energy from moving water). Dams are often considered some of the greatest examples of engineering in the world, but some of the best builders of dams aren't human. Beavers can build dams strong enough to stop large rivers and streams using only logs, sticks and mud. Whether built by beavers with wood or by humans with concrete and metal, dams can come in many shapes and forms. Check out the different kinds of dams below, and see which kind most resembles the dam you built:



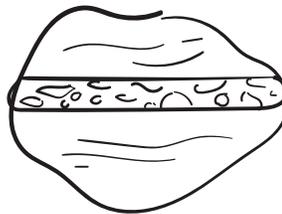
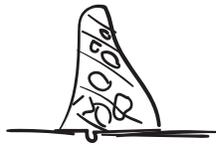
## TIPS

- Don't use materials that will absorb water; this will make your dam weaker and more likely to break.
- While you don't want water to go over your dam, it's just as important that water can't go under it. Try using mud, playdough or other material at the bottom that will create a seal.
- Dams don't have to just be large, thick walls. You can add supports on either or both sides of your dam to help hold it up.
- Instead of one that completely stops and holds the water, try building a dam that changes the direction the water moves.

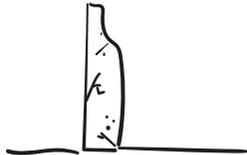
### Side View

### Top View

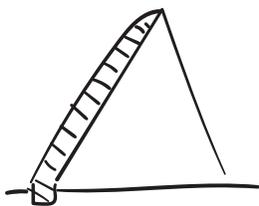
#### Gravity



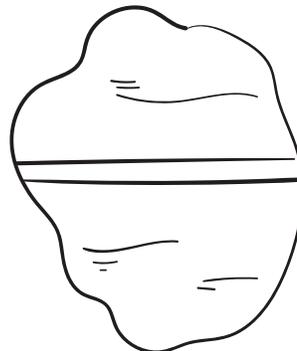
#### Arch



#### Buttress



#### Embankment



## HELPFUL WORDS

**Arch:** a structure that curves upwards or backwards over an opening

**Buttress:** supporting wall built at an angle to the structure it supports

**Dam:** a barrier preventing the flow of water or other materials

**Downstream:** the direction water is flowing

**Cut-off:** a waterproof barrier at the bottom of a dam

**Embankment:** a natural structure with a flat top and sloping sides

**Overflow:** when liquid can't fit into a designated space and flows out

**Reservoir:** the water that builds up behind a dam

**Seepage:** water leaking through a dam

**Spillway:** the part of a dam that can open to release water

**Structure:** something built to resist force

## Talk like an engineer!

1. Dams are barriers built to resist water flowing downstream.
2. My dam did/did not have overflow.
3. Water pooled up behind my dam to form a reservoir.
4. I designed my dam with a cut-off to help prevent seepage.
5. I may need to build spillways in my dam to stop it from overflowing.

## Want to learn more about building dams? Check out the links below:



### PBS: How Beavers Build Dams

<https://www.youtube.com/watch?v=yJjaQExOPPY>



### Hoover Dam for Kids

<https://www.youtube.com/watch?v=H6WY-5u3dlc>



### Dams 101

<https://www.damsafety.org/kids>



### Why Do We Build Dams?

<https://www.nationalgeographic.org/media/why-do-we-build-dams/>



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