

LESSON 3 / FAMILY GUIDE

Get the Water There

Can you deliver water without wasting it?

ENGINEERING CHALLENGE: Build a system that carries water from one source to three different destinations while wasting as little as possible.

At a Glance

Age	6-10 years
Estimated time	30-60 minutes
Engineering field	Civil & Water Resources Engineering
Engineering practices	Imagine, Create, Test, Improve
Big ideas	Water distribution, flow, and efficiency

Materials

Gather these first

One starting container; three small cups or bowls as destinations; water; a tray or towels for spills; and two to four household materials for pathways.

- Aluminum foil, straws or tubing, small cups, clean plastic bottles, cardboard, funnels, or sponges.
- Optional: a measuring cup, markers, paper, toy plants, or sketches of gardens, homes, and other destinations.

Caregiver Notes

Your role

Encourage your child to decide how the water should divide, where paths should go, and how to reduce loss. Avoid fixing a struggling design before the child has had a chance to investigate.

Equal amounts are not always the goal. Destinations may have different water needs. Use small quantities and reuse collected water whenever possible.

Start the Conversation

Why water engineers study this

Think about how water reaches a home faucet, a garden, a farm, or several houses in one neighborhood. A single water source may need to serve many destinations.

How can water reach all of them? What causes water to be lost along the way? Engineers consider paths, distance, flow, and efficiency.

Choose a Starting Point

Story connection

Three garden plants depend on one source. One is near, one is far away, and one needs more water. How might you design routes that address these different needs?

Real-world connection

Think of hoses and sprinklers, farm irrigation, water towers, pipes, canals, rain barrels, and buckets. What makes some systems suited to some places but not others?

Ask Your Child

- How could one source reach three destinations?
- Would each place need the same amount of water?
- What makes reaching a distant destination difficult?
- How can we save water while moving it?

Meet Water Engineers

Charitie Ropati - Water Engineer

Trained in civil engineering with a water-resources focus; her experience includes water and wastewater infrastructure for rural Alaska Native communities. Ask: Why might rural and large-city water systems differ?

Orval Hernandez-Marcial - Environmental Engineer

Works in civil/water resources and stormwater-related engineering, including on-site water-management design. Ask: What would an engineer need to learn about a neighborhood?

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LESSON 3 / FAMILY ENGINEERING ACTIVITY

Get the Water There - Let's Engineer!

YOUR CHALLENGE: Build a system that carries water from one source to three different destinations while wasting as little as possible.

Open Challenge

Set up and explore

Set out one source and three empty destination cups or bowls. Design routes to all three and try to reduce leaks, spills, and water left stranded in the system.

What to Do

1. Imagine Study the source and three destinations. Sketch or explain how you could connect them.

2. Create Build the system and decide where water should travel and divide.

3. Predict Which destination will get the most? Where might water leak or spill?

4. Test Start with a measured amount. See what reaches each place and what is lost.

5. Improve Adjust an angle, connection, or pathway, then compare results using the same starting amount.

Make It Your Own

Getting started

Start with only two destinations. Once your routes work, add the third.

Ready for more?

- Aim for approximately equal amounts at all three cups.
- Assign each place a different water need.
- Reduce water trapped or spilled along the route.
- Compare two designs with the same initial water volume.

Talk About It

- Where was water lost?
- Why did one place receive more than another?

- Which small change made a difference?
- Was your priority speed, delivering an appropriate amount, or saving water?

Before You Finish

How did your changes affect the amount of water reaching each destination?

Invite your child to share discoveries through conversation, drawing, writing, photographs, pointing, or building. Record ideas in your Unit 2 Engineering Notebook if you wish.

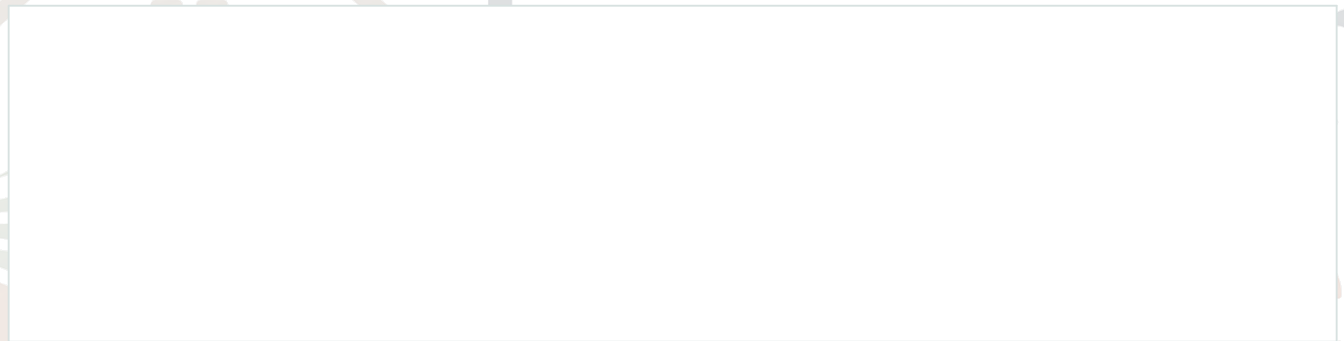
Safety Reminder

Use small amounts of water and trays or towels, keep away from electrical items, and reuse water when you can.

ENGINEERING DESIGN PROCESS ASK > IMAGINE > CREATE > TEST > IMPROVE

Optional: Family Notes and Sketches

Use this space for a quick drawing, a question, or something you noticed while engineering together.



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