



Project Exploration creates transformative learning opportunities for youth underrepresented in the sciences –particularly students of color and girls – by equipping them with the skills, practices, and mindset needed for a lifelong pursuit of learning. STEM@Home makes activities around science, technology, engineering, and math accessible and fun to do at home. This STEMbook activity, resources, and more are available at [www.projectexploration.org/stemathome](http://www.projectexploration.org/stemathome).

## In this activity, you will:

construct a bridge that helps the goats pass, without being trapped by the troll!



## Supplies Required:

- 10 straws
- 10 popsicle sticks
- 10 toothpicks
- 1 piece of styrofoam
- 3 sheets of cardboard
- 4 paper cups
- Tape
- Glue
- Scissors
- 4 toilet paper rolls

## Video

Follow along as The Three Billy Goats Gruff is read aloud: <https://tinyurl.com/y5xo5ebd>

## Overview

Three billy goats want to go up a hillside to eat some grass. They have to cross a bridge to get there. Under the bridge lives a mean, ugly, old troll who wants to eat them! Use your engineering skills to help the goat cross the bridge without being eaten. How will you construct the bridge to protect the goats?



## Instructions

1. **Problem:** What do we want to solve? How can you use the materials to build a bridge to help the goats get to the grassy hillside and escape the mean old troll?
2. **Solutions:** What are some ways to solve the problem? Build a troll-proof bridge that stands on its own so the goats can cross the river. What shape will it be? How tall will it be? How strong will it be?
3. **Model:** Build your design! Gather your materials and build your troll-proof bridge.
4. **Test:** Does your model work? Place your animal figure on the bridge to test its stability and strength. Is it sturdy or do you need to make some changes to make it more secure?
5. **Reflect & Redesign:** Was your model successful? Does it need to be redesigned? If it does not stand strong, what can you do to reinforce it and make it stronger?

## Additional Resources

**Think About It!** Compare your bridge with others to see what is similar and what is different about the construction of your bridge. Your bridge is going to have to reach another hillside that is twice the length as your first bridge. What changes will you have to make to double the size of the bridge?

1. What makes bridges so strong? <https://tinyurl.com/hy7z5sy>
2. Read more about bridges and how they work: <https://tinyurl.com/yc4dhdos>

## Share It Out

**Share on social media:** Take a photo of your bridge and share it on social media! Use the hashtags:

#GoatBridge  
#ProjectExploration  
#StemAtHome

For more activities like this one, go to [www.projectexploration.org/stemhome](http://www.projectexploration.org/stemhome). If you're interested in learning more about Project Exploration and our free events, programs, and activities, please find us on social media and be sure to follow!



Call or text us for help: 312-772-6634

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