



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.

In this activity, you will:

explore some interesting facts about paper, wood and things we can design/build with them. You will learn how to create a device that increases your ability to see something using materials that come from paper.



Supplies Required:

- 3 cardboard toilet paper rolls
- Hot glue gun and glue sticks
- Black duct tape
- Scissors
- String, yarn or twine
- Hole puncher
- Acrylic optic sheet

Videos

Listen to [Rosie Revere, Engineer](https://tinyurl.com/sj99vm8) before completing the activity: <https://tinyurl.com/sj99vm8>

Overview

When we think about engineers and the design process, we know that the materials have to come from somewhere. A chair begins as a tree in a forest. A toilet paper roll comes from a softwood tree. In this activity, you're going to use empty toilet paper tubes and yarn--both made from wood and wood fibers. You will use these materials to make a set of binoculars, a device that makes distant objects appear nearer. If you've ever been to the skydeck of the Willis Tower, you know to get a better view of special places far away, you need a set of binoculars. The purpose of this activity is to show that our wonderful designs require material and the materials come from somewhere. Let's find out where!



Instructions

1. Cover 2 toilet paper rolls with duct tape.
2. Snip/cut off a small section of the 3 toilet paper rolls.
3. Cover it with tape.
4. Get an adult to help you - hot glue the small piece in the center.
5. Apply a band of duct tape to secure.
6. Punch holes and tie on a yarn strap.
7. Using the acrylic optic sheet, cut a circle the size of the toilet paper tube for both eyes.
8. Get an adult to help you seal both eyes with the hot glue gun.
9. Take your binoculars on an adventure and record your observations!

Additional Resources

Think About It! Are you an aspiring engineer? Have you ever designed or created something? What would you like to invent? What materials would you need? Rosie found treasures to add to her engineer stash, what will you find to add to your stash?

1. Learn how to turn wood into paper: <https://tinyurl.com/vwobd5a>
2. Learn more about the history of toilet paper and how it is made: <https://tinyurl.com/2nvyox>
3. Extra directions for DIY binoculars: <https://tinyurl.com/s96vk8o>

Share It Out

Share on social media: Share pictures of what you saw with your binoculars! What would you share with others how important wood and paper products are in our daily lives? In the meantime, think about sharing your knowledge and your design on social media. Tag a brand that uses wood to make cardboard and share your knowledge!

Use the hashtags:

#EngineerReadAlong
#ProjectExploration
#StemAtHome

Share via PE's website: Students who complete STEM@home activities and share what they learned with the PE team via our website will earn points which can be traded in for cash prizes at the Explore Store. Your project number is 106. Learn more at www.projectexploration.org/explore-store

Join PE's character contest!

Design a STEM character who will lead kids through activities and be featured on our website and in our STEMbooks. Cash prizes will be awarded to the top 3 finalists. Learn more at: www.projectexploration.org/character-contest.



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

www.projectexploration.org