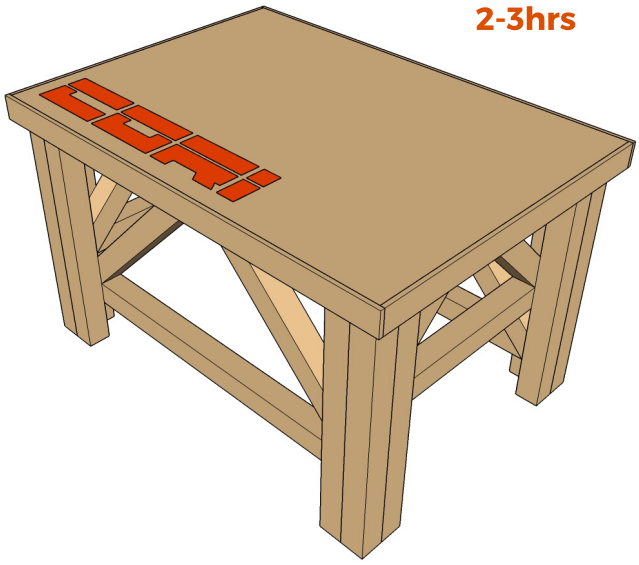
CORI STEP STOOL

Build Time
2-3hrs

In one of our more advanced CORI projects to date, the CORI Step Stool lesson challenges students with structural engineering and math concepts. Students will learn to measure, construct and test their step stool throughout this design challenge.



GUIDED RESEARCH QUESTIONS

- A step stool is a form of a ladder. What are 3 other types of ladders and explain the functional differences between them?
- Why are 3-legged stools considered to be more stable?
- Where are the longest ladders in the world located? How many rungs do they have each?

Fun Historical Facts

- The first step ladder was invented by John Basely in 1862.
- The earliest evidence of use of a ladder was found in Spider Caves in Valencia, Spain that dates back 10,000 years on a Mesolithic rock painting.

DESIGN CHALLENGE

CORI Step Stool Design Challenge Prompt: Using CORI beams, design and construct a step stool with the appropriate width, length and height to hold two human-sized feet. You will need to cut the CORI beams at appropriate dimensions, as well as precise angles for structural fit and stability.

Challenge #1: Follow the instructions provided and have your teacher/parent successfully stand on it.

Challenge #2: Design your own step stool to hold up to 50lbs of weighted objects (books, workout weights, etc.) without using CORI instructions.

Challenge #3: Design your own step stool to hold up your teacher/parent without using CORI instructions.

Bonus Challenge: Design a step ladder stool that has two steps.

FOUNDATIONAL MATH CHALLENGE

CORI Area & Perimeter

- What is the perimeter of the top of your CORI Step Stool based on your measurements?
- What is the area of the top of your CORI Step Stool based on your measurements?

Sample Word Problem

- What is the perimeter of the top of the step stool with a length of 12 inches and width of 9 inches?
- Find the missing side length when the area is 63 square units. See picture on right.

W = 9 units

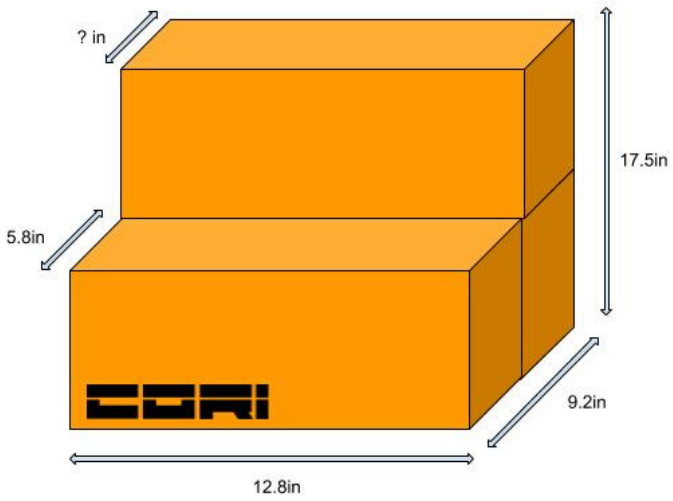
Area =
63 square units

STEPPING IT UP MATH CHALLENGE

Word Problem

- The owner of the furniture store recommended his carpenters make 3-legged stools to conserve on wood. Last year they built 504 4-legged stools. How many 3-legged stools could they build with the same amount of wood as last year?

- Build a step stool with two steps as shown on the right. Find the missing dimension (?). How many square inches of cardboard is needed to build this step stool?



FOLLOW UP DISCUSSION AND QUESTIONS

1. Did your step stool work on the first try? Why or why not?
2. What would it take to design a multi-rung ladder using CORI Beams? How many beams do you think it will take to design one?
3. What coating can you add to the CORI Step Stool to make it last longer?
4. Will you be using the CORI Step Stool in your house or classroom?
5. What industry applications have you seen the step stool in the real world?

ADDITIONAL OPEN EDUCATION RESOURCES

- **Basic Angles Geometry from Khan Academy:** https://www.khanacademy.org/math/basic-geo/basic-geo-angle
- **Area and Perimeter from Open Education Resources (OER):** https://www.oercommons.org/authoring/8677-area-and-perimeter-lesson/view
- **Basic Area & Perimeter from Khan Academy:** https://www.khanacademy.org/math/basic-geo/basic-geo-area-and-perimeter
- **CK12 Area & Perimeter:** https://www.ck12.org/geometry/square-and-rectangle-area-and-perimeter/

#CORICREATE COMMUNITY

Our growing #CoriCreate Community is a place to share your designs, ideas and connect with other Cori enthusiasts. We would love to have you share your projects to the various social media platforms using our hashtag #CoriCreate. See you online!