**Toolbox CORIculum**

The Toolbox CORIculum is designed to use math skills through applied experiences. The CORI Toolbox lesson plan challenges students with the following math concepts: Volume, Measurement and Estimation. Design and construct a toolbox to fit your maker and tinkering tools. Students will learn to measure, construct and decorate their very own toolbox using CORI beams.
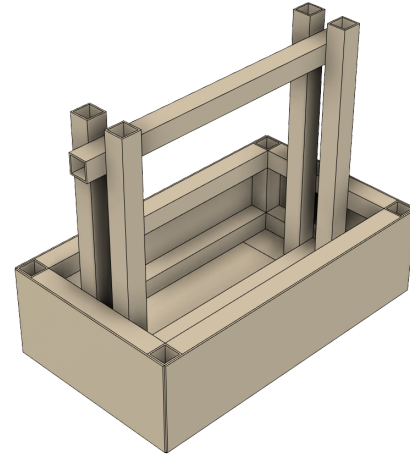
Objective:
Students will apply math geometry concepts with a real volume design project.

Grades Levels: 3rd - 8th Grade   **Lesson Duration**: 2 - 3 hours   **Build Time**: 60 - 90 min

Additional Materials Recommended	
● Hot glue guns ● Gluesticks ● Scissors	● Rulers ● Pencils ● Art supplies (optional) - Decorate your toolbox

CORI Toolbox Design Challenge:
Using CORI beams, design and construct a toolbox with the appropriate width, length and height to fit your standard CORI maker, garage and craft tools. You will need to measure and cut the CORI beams at appropriate dimensions to build your toolbox correctly.

Guiding Discussion Prompts

- Why are toolboxes famously known for being the color red?
- What tools are typically found in a toolbox?
- What other materials are used for toolboxes?

The CORI Toolbox presents math problems in an experiential way. The CORI Toolbox lesson integrates common core math standards 3rd through 8th grade. Below are example math problems and prompts to facilitate applied math conversations with students. The math section will have the following components for teachers to use with students.

- CoriCreate Math prompts that directly apply with student CORI designs and creations
- Sample math word problems
- Additional open education resources related to lesson plan
- Reflection questions

Math Application CHALLENGE:

- What is the perimeter of the CORI Toolbox top component based on your measurements?
- What is the area of the CORI Toolbox bottom piece based on your measurements?
- What is the volume of the CORI Toolbox based on your measurements?

Follow Up Sample Math Problems

a. What is the volume of a tool box base with a length of 14 inches, width of 6 inches, and height of 5 inches?

b. Find the volume of the following rectangular prism.

H = 5in
L = 12in
W = 4in
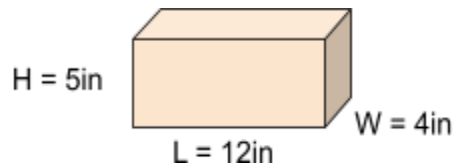
c. Which rectangular prism has a larger volume? Circle your answer.

H = 12.7 mm
W = 2.5 mm
L = 5.2 mm

H = 5.9 mm
W = 5.1 mm
L = 6.9 mm
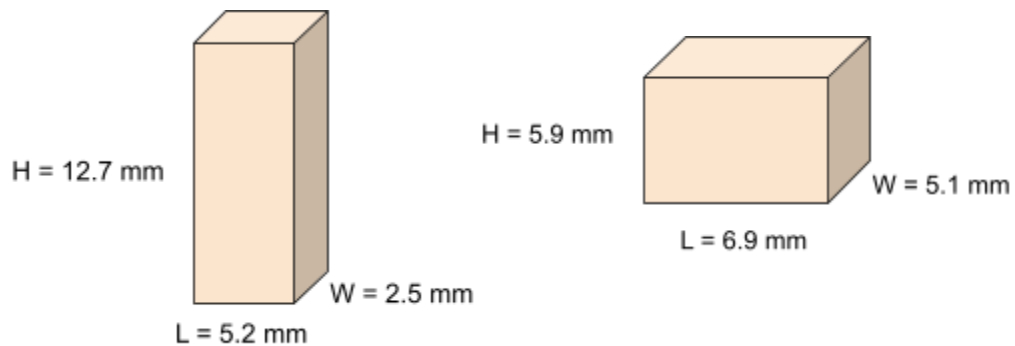
Step It Up Math Challenge

A club hammer is typically used for light demolition work and is known to be a smaller version of a sledgehammer. A typical club hammer is about 14 inches long. What volume size do we need for a toolbox to carry the club hammer if we were to completely fit it into the toolbox? What dimensions would be ideal? Sketch out a toolbox design with length, width, and height.

Fun Historical Facts
- Oldest dated tools were found in Kenya in 1969. Estimated to be 2.6 million years old.
- Early hand tools were made with antlers, husks, stones, rocks, bones of animals, and even volcanic glass.

Additional Open Educational Resources

- Basic Volume and Surface Area from Khan Academy:
  https://www.khanacademy.org/math/basic-geo/basic-geovolume-sa Volume and Surface

- Area from Open Education Resources (OER):
  https://www.oercommons.org/courseware/lesson/2484/overview

- National Council of Teachers for Mathematics:
  https://www.nctm.org/ClassroomResources/Illuminations/Interactives/Cubes/

Reflection Questions

1. What other types of containers are used to hold tools?
2. What other items could you build with the CORI Toolbox as the foundation?
3. What are real life situations that CORI Toolbox could be used for if they were real steel beams?
4. What careers do you think use volume in their profession?