CARDBOARD CREATORS

PROGRAM DESCRIPTION

Family Learning Lab [Exploration Lab] – Spring 2026 Tuesdays 1:45pm

Engineering Design & Creative Construction (Grades 1–5)

Program Overview

Cardboard Creators is a hands-on engineering and design lab where students explore real-world building techniques using recycled cardboard and simple fasteners. In each session, students are introduced to a construction method, identify a design goal, build a prototype, test its performance, and refine their design to improve function, strength, or usability.

Students practice the full engineering design cycle: **ask – imagine – plan – create – test – improve.**

Cardboard Creators is an Exploration Lab which means students will receive basic instructions and ideas tied to a particular project, but then given time to free create with supervision and support.

Materials List

Students are not required to supply materials but they are welcome to bring their own. Personal materials should be stored in a labeled backpack, bag, or kit and brought to each class. Please label all personal items.

Recommended personal materials list:

- **Duct tape,** plenty
- **Cardboard building tools** including cardboard scissors. No excessively sharp objects - must be made for kids. We will inspect all tools for safety.
- **Fasteners and hinges** made for cardboard creations. We will be teaching kids how to make these from cardboard and recycled materials, but you are welcome to bring the plastic pre-made versions if you'd like.
- **Cardboard Jigsaw** Chompsaw or BeaverBot (MUST be one of these brands as they are cleared for safety.) You are welcome to bring your own cardboard jigsaw if you'd like your child to have exclusive use of theirs. We have one to share and multiple safe ways to cut cardboard including cardboard scissors.
- **Wood Glue.** NO personal glue guns as these vary in temperatures and can be unsafe for kids. We will be using special glues that are safe for kids and always under adult supervision.
- **Safety glasses** if your child does not want to wear those provided.
- **Noise canceling headphones** if your child is sensitive to noise.

LAB OBJECTIVES

Lab #1

Spinning Tops – Basic Cutting & Fastening

Students design a spinning mechanism using different fasteners, compare how design choices affect motion, and improve balance and spin time through testing and redesign.

Spinning Tops Battle – Basic Cutting & Fastening

Students refine spinning top designs to meet performance goals, analyze which designs spin longer or more stably, and improve their prototypes through competitive testing.

Lab #2

Challenge Dice (Build-and-Play) – Fold & Tab Locks

Students design a playable rolling object, test how well it holds shape and rolls fairly, and improve their design based on performance and durability.

Lab #3

Cardboard Castles – Folding, Slots & Hinges

Students design and build a standing structure using interlocking parts and hinged elements, then test and improve their designs to increase strength, stability, and function.

Cardboard Castles – Flanges, 3D Components

Students revise and expand their castle structures by analyzing weak points, strengthening joints, and improving structural features.

Lab #4

Cardboard Rocket Ship – Tabs & Slots, Flanges, 3D Components

Students define a design goal for a standing 3-D model, construct a prototype using interlocking parts, and improve stability through redesign.

Cardboard Rocket Ship – Design Extension Session

Students test and reinforce their rocket structures, improving balance, strength, and visual design.

Lab #5

Flying Gliders – Bend (Airfoil Curve) & Slot Wing Locks

Students design and test flying models, then improve shape and weight placement to increase flight distance and stability.

Flying Gliders – Flight Optimization Session

Students compare multiple designs and refine their gliders to improve lift, balance, and controlled flight.

Lab #6

Cardboard Maze Game – Gussets (Corner Bracing)

Students design a tilt-maze game, identify weak structural areas, and reinforce corners and supports for reliable play.

Cardboard Maze Game – Playtesting Session

Students analyze how design changes affect game performance and improve durability and motion control.

Lab #7

Cardboard Catapults – Layering

Students design small launchers, test how layered cardboard increases strength, and refine designs to improve distance and accuracy.

Cardboard Catapults – Performance Optimization Session

Students revise catapult designs based on testing results to improve launch consistency and structural durability.

Lab #8

Robot Head / Wearable Helmet – Flange & Tab Seams

Students design a wearable 3-D form that fits securely, testing seam strength, comfort, and structure, and refining their designs.

Robot Head / Wearable Helmet – Design Refinement Session

Students improve size, fit, and durability through redesign and structural reinforcement.

Lab #9

Build-A-Bots – Modular Connections

Students design modular robot parts that connect in repeatable ways and can be rearranged to form multiple configurations.

Build-A-Bots – System Expansion Session

Students analyze modular designs and improve how parts connect, grow, and change.

Lab #10

Cardboard Creators – Open Create (Capstone)

Students apply multiple construction techniques to design and build an original project, testing and refining their designs to improve performance and structure.