

BRIDGE RESCUE MISSION

A hands-on engineering briefing for young makers & families

MISSION #01

STRUCTURAL LAB



MISSION ALERT: A vital bridge has failed, and critical supplies need a safe route across the canyon! Your task is to design, build, and test a new bridge that spans **12 inches** and holds at least **5 pounds**. Think like a real engineer to solve the challenge!

MEET YOUR RESCUE TEAM

**Max "The Span"****FIELD BUILDER***"Span 12" & Hold 5 lbs!"*

Builds physical structures using approved materials to bridge gaps safely.

**Professor Pivot****MISSION CONTROL***"Test, Learn, & Redesign!"*

Analyzes test results and chooses smart improvements for the next iteration.

**Coach Beacon****FAMILY COACH***"Ask Great Questions!"*

Helps grown-ups coach from the sidelines without taking over the challenge.

TARGET SPAN
12 Inches

GOAL LOAD
5 lbs Min.

MATERIALS
Approved Only

MINDSET
Test & Improve

CHOOSE YOUR MISSION TIER

☐ **BASE MISSION**

Build a bridge that spans 12 inches and holds 5 pounds safely without collapsing.

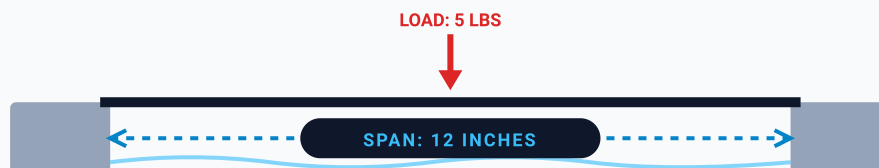
☐ **ADVANCED**

Hold more than 5 pounds OR use fewer materials to build an extra-efficient bridge.

☐ **ELITE MISSION**

Balance maximum strength, lightweight materials, and a successful redesign cycle.

BRIDGE LOAD & SPAN TECHNICAL SPECS



GROWN-UP FIELD GUIDE

Support your young engineer while letting them lead the challenge!

COACHING MODE

THE ENGINEERING PROCESS

1

PLAN

Sketch ideas & choose approved materials.

2

BUILD

Construct the bridge frame & span.

3

TEST

Apply load safely up to 5 pounds.

4

PIVOT

Improve strength & redesign smart.

COACHING SIDEBAR



GREAT QUESTIONS TO ASK

- "What worked well in this design?"
- "What changed after we added weight?"
- "What will you try next to make it stronger?"
- Ask which part of the frame feels sturdy or weak.
- Encourage perseverance when beams bend or fall.
- Celebrate effort, creative thinking, and learning!



TRY NOT TO...

- **Build or fix the bridge for your child.**
- **Skip testing** because a step feels tricky.
- **Ignore safety expectations** when loading weight.
- **Focus only on whether it "wins"** — celebrate learning!

WHAT SUCCESS LOOKS LIKE:

Success isn't just a bridge holding weight — success means your child **PLANS, BUILDS, TESTS, IMPROVES**, and can confidently explain what they learned from the process!

EXPLORE STRUCTURAL TRUSSES

POPULAR STRONG SHAPES FOR INSPIRATION

WARREN TRUSS



Triangles spread weight evenly

TIED-ARCH



Curve redirects load outward

CABLE-STAYED



Cables pull deck toward tower