aaaworkspace

Better Space. Better Work.

VOLUME 1

STEM BUILDING CHALLENGES

Hands-On Engineering Activities for Grades K–5

TEACHER RESOURCE LIBRARY • VOLUME 1

WHAT YOU'LL FIND INSIDE

- 3 Ready-to-Teach STEM Challenges
- Step-by-Step Teacher Instructions
- Classroom Extension Ideas
- Materials Checklist
- Product Recommendations

GRADES

Kindergarten–Grade 5

ESTIMATED ACTIVITY TIME

20–45 Minutes

PERFECT FOR

- STEM Centers
- Indoor Recess
- Makerspaces
- Classroom Challenges
- After-School Programs



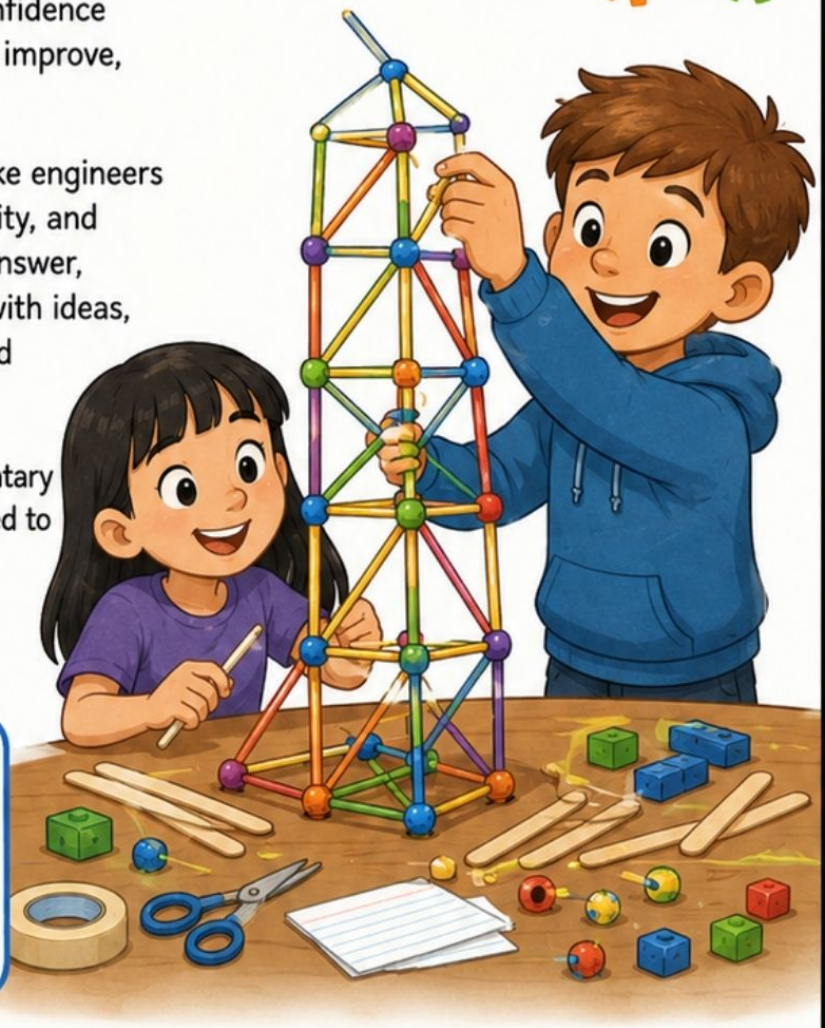
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Why STEM Building Matters

One of the best ways to help students develop confidence is by giving them opportunities to build, test, fail, improve, and try again.

Building challenges encourage students to think like engineers while naturally developing communication, creativity, and teamwork. Instead of simply finding the correct answer, students learn how to ask questions, experiment with ideas, and improve their designs through observation and collaboration.

Whether you're teaching kindergarten or upper elementary students, STEM building activities can easily be adapted to meet different learning levels while keeping every student engaged.



Students Practice

- Critical Thinking
- Problem Solving
- Measurement
- Engineering Design
- Teamwork
- Creativity

Materials You'll Need

- Construction Paper
- Masking Tape
- Wooden Craft Sticks
- Building Blocks
- Index Cards
- Plastic Cups
- String
- Scissors
- Rulers
- Stopwatch
- Storage Bins

Teacher Tip



Allow students to make mistakes.

The best engineering lessons happen when students discover how to improve their own designs rather than being shown the "correct" answer immediately.

Activity 1

Build the Tallest Tower

Objective

Students work together to build the tallest free-standing tower possible using limited classroom materials.



Materials

- Craft Sticks
- Masking Tape
- Index Cards
- Plastic Cups
- Ruler

Instructions

1. Divide students into small teams.
2. Give each team identical supplies.
3. Explain the challenge.
4. Students have twenty minutes to build.
5. Measure each tower.
6. Discuss why some designs were stronger than others.

Teacher Questions

- What worked?
- What failed?
- What would you change?
- How did your team work together?

Extend the Lesson

Repeat the challenge using fewer materials or introduce a weight-bearing requirement.

Activity 2

Bridge Challenge

Objective

Design a bridge that spans two desks while supporting as much weight as possible.



Materials

- Craft Sticks
- Tape
- Paper
- Books
- Coins

Instructions

1. Students build a bridge.
2. Place books underneath.
3. Slowly add weight.
4. Record the maximum weight supported.
5. Redesign.
6. Try again.



Discuss

- Why did your strongest bridge succeed?
- Which shapes created the greatest strength?



Classroom Extension

- Research famous bridges around the world.
- Compare classroom designs to real engineering projects.



Activity 3

Marble Maze Engineering

Objective

Students design a working marble maze using classroom materials.



Materials

- Cardboard
- Construction Paper
- Tape
- Marbles
- Scissors
- Markers

Instructions

1. Create pathways.
2. Add obstacles.
3. Test the maze.
4. Improve weak sections.
5. Challenge another team to complete the maze.

Teacher Tips

- Encourage students to redesign multiple times.
- Celebrate creative solutions rather than perfect results.



Learning Connections

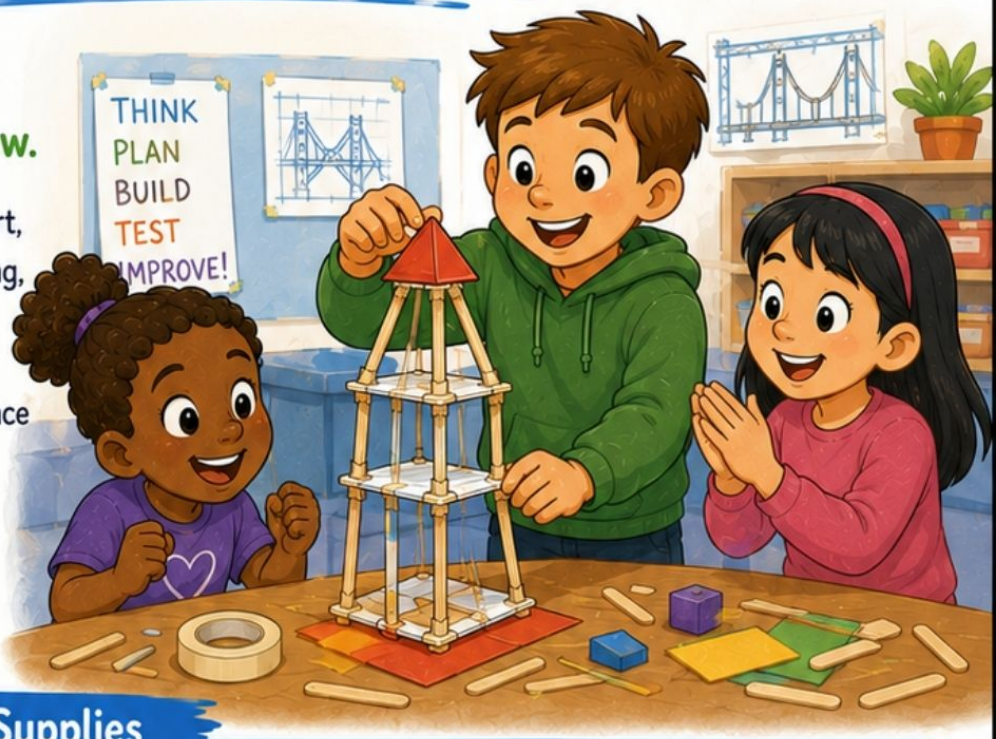
- Engineering
- Physics
- Problem Solving
- Collaboration
- Creativity

Keep Building!

Every engineering challenge teaches students something new.

Whether a structure stands tall or falls apart, students gain valuable experience in planning, testing, improving, and working together.

These hands-on moments help build confidence while making STEM concepts exciting and memorable.



Recommended Classroom Supplies


Construction Paper


Building Blocks


Craft Sticks


Index Cards


Masking Tape


Storage Containers



Timers


Classroom Scissors

Continue Your Teacher Resource Library



- Active Play & Brain Breaks
- Indoor Recess Activity Guide
- PE Class Activity Book

Need help finding the right classroom supplies?

The AAA Workspace Education Team is here to help you select products for classrooms, STEM labs, makerspaces, libraries, after-school programs, and school districts.



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