



Popsicle Stick Engineering!

Supplies:

- Popsicle Sticks
- Hot or Tacky Glue
- Graph paper
- Rulers

*Extras are noted in the individual activities below

Directions:

Building Bridges:

*Small toy cars

Look up suspension bridges. Have girls work in teams to:

1. Design a bridge on graph paper
2. Build the bridge using popsicle sticks and glue (you will need time for the glue to dry)
3. Drive a car over the bridge
4. Discuss the design, angles, geometric shapes; what would they do different if they were to complete the activity again? Do they think their design would work if built in real life?

Build a tower:

*Books

Set a challenge: this will depend on the amount and length of the Popsicle sticks = 1-3 feet tall. Build a tower to the set height. The goal: which tower can hold the most weight? Girls should work in teams to:

1. Design a tower on graph paper
2. Build the tower using popsicle sticks and glue (you will need time for the glue to dry)
3. Once dry, add a single book to the top of each tower. Keep adding books until the towers topple.
4. Discuss the design, angles, geometric shapes; why did one support more than the others? Would they design the towers differently if they were to complete the activity again? Do they think their designs would work if built in real life?

Build a three dimensional (3D) structure:

Girls can work as individuals or in a team to:

1. Design a structure
2. Build the structure with popsicle sticks and glue (you will need time for the glue to dry)
3. Discuss the designs – why was the design chosen? Did the girls create an object for a purpose (planter, bowl, etc.)?

Leader/Parent Note: Design (art) is a huge part of all of the STEM subjects and is often underestimated. When building a 3D structure, there are common shapes that will be used, i.e.; sphere, cube, and pyramid. These shapes are the foundation of geometry and higher mathematics; like physics and rocket science!

STE(A)M Subject(s):

Engineering, Math - Geometry, Art

Related Badge(s) or Journey(s):

(B) Making Games, Inventor (J) Product Designer (C) Woodworker (S) Room Makeover

Additional Resources:

Advanced lesson: <http://tryengineering.org/lessons/popsiclebridge.pdf>

Alternative bridge options: <http://www.scholastic.com/browse/lessonplan.jsp?id=1509>

Build a Super Bridge: <http://www.pbs.org/wgbh/nova/bridge/>

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