

STEM Kit Instructions

Please perform all activities under adult supervision

POPSICLE CATAPULT (Level 1) – Launch marshmallows or paper wads with style – build a Popsicle Catapult and let gravity know who's boss!

What you will need:

- 15 popsicle sticks
- 3 rubber bands
- (Optional) 1 bottle cap

Step-by-step guide:

1. Stack 13 popsicle sticks neatly on top of one another.
2. Wrap both ends tightly with rubber bands.
3. Slide 1 popsicle stick between the second and the third sticks from the bottom to form a crossbeam that sticks out about 2 inches.
4. Lay the final stick (the launch arm) across the top of the stack, lining up one end with the short tip of the crossbeam. Wrap a rubber band around the spot where they meet to hold them together.
5. Your catapult is ready for liftoff! If you want, glue a bottle cap to the end for an easy projectile holder.



What's the science behind it?

When you pull back the catapult arm, energy is stored with the stretch. When you let go, the stored energy turns into another form of energy and makes the arm snap forward.

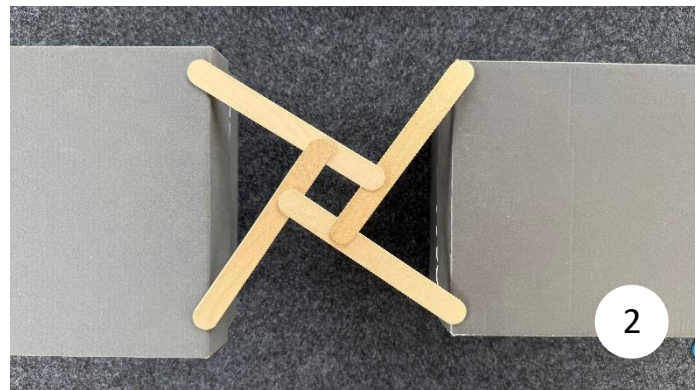
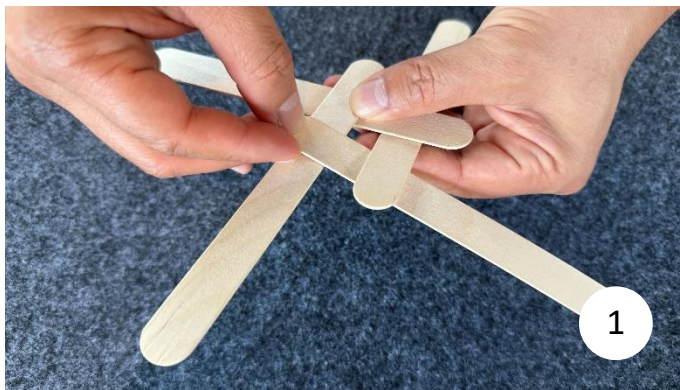
INTERLOCKING BRIDGE (Level 2) – Can't quite reach the other side of the river with the planks you've got? Build an interlocking bridge and let smart design do the heavy lifting!

What you will need:

- 4 popsicle sticks – that's it!

Step-by-step guide:

1. Take four popsicle sticks and lay them in a crisscross pattern, like making an "X" on top of another "X." Position each new stick so it pokes out just a little bit from the edges.
2. Carefully hold your bridge with both hands, then place each end on opposite sides of your pretend river. Gently adjust the sticks to form a neat, balanced pattern.
3. Time to test its strength: start placing small objects on top – coins, toy figures– and see how much it can hold before it tumbles!



What's the science behind it?

The interlocking bridge relies on angled pieces, compression, and friction to stay intact – no glue or columns needed. Its arched design evenly distributes weight and spans the river with ease.

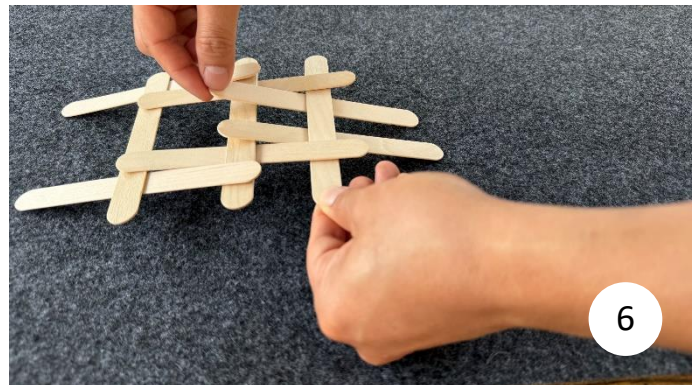
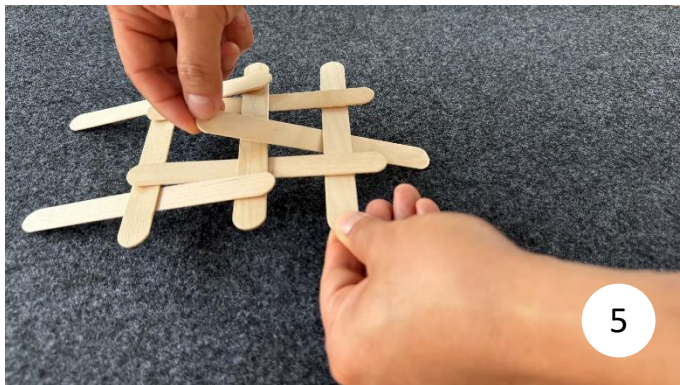
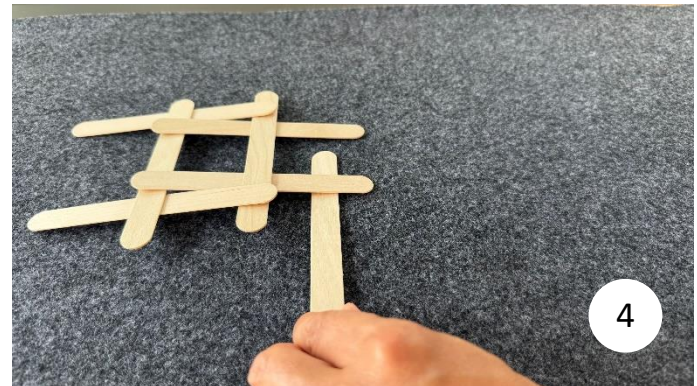
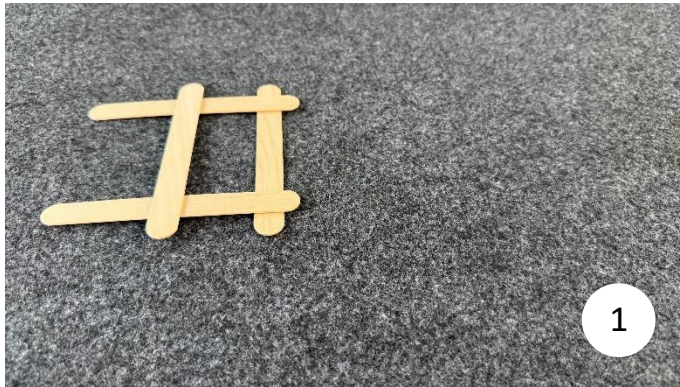
DA VINCI BRIDGE (Level 3!) – Inspired by Leonardo da Vinci’s brilliant design, this self-supporting bridge uses only balance, tension, and compression—no glue, nails, or ropes needed! It’s all about smart construction and steady hands.

What you will need:

- 15 popsicle sticks

Step-by-step guide:

Building a Da Vinci Bridge takes steady hands, and a whole lot of patience! Follow the picture guide to get started building your very own bridge! If you find more sticks around the house, can you repeat steps 4 through 8 and make the bridge even bigger and taller?





What's the science behind it?

The Da Vinci Bridge is a smarter version of the interlocking bridge, using the same STEM ideas like balance and tension to stay strong without glue or nails.