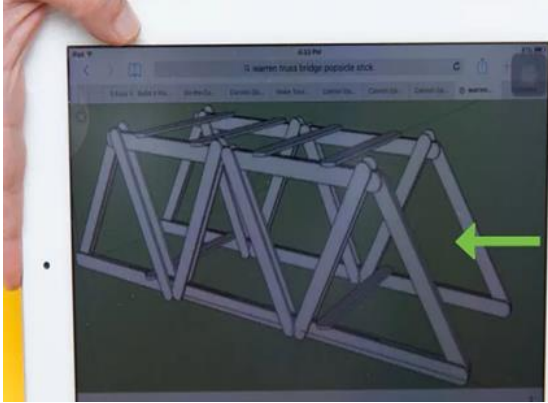



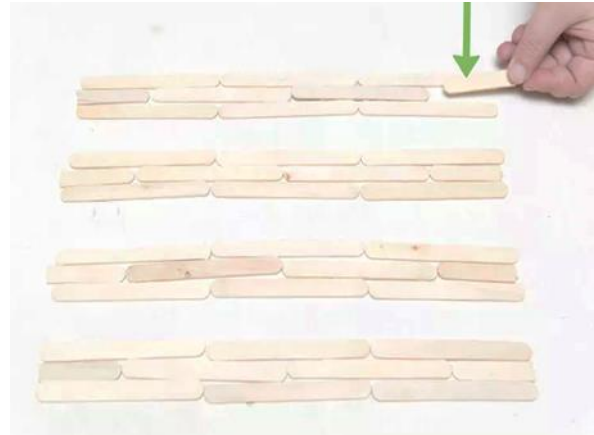


Wooden Bridges

Procedure	Image/ Result Sample
<p>1. Imagine a blueprint for your bridge</p> <p>a. <i>Generally, a truss bridge has:</i></p> <ul style="list-style-type: none">i. Crosswise floor beams and struts.ii. A deck, that forms the walkway or road of the bridge.iii. Longways laying stringer beams beneath the deck.iv. An external frame, composed of squares divided into triangles for better integrity.v. Cross bracing forming an X along the top sections of the bridge.	
<p>2. Draw the blueprint of just the sides of the bridge. Measure how long to make the side of the bridge using a popsicle stick as a reference.</p>	

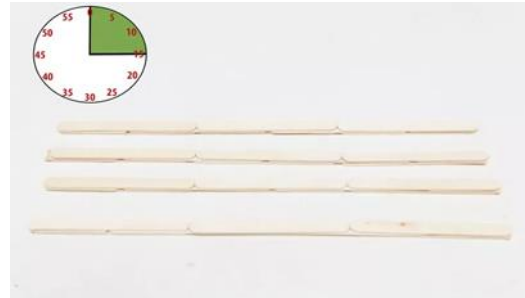
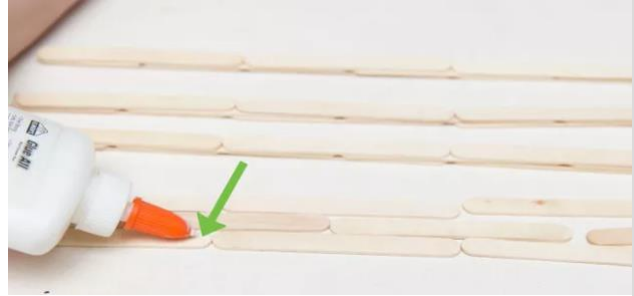


3. **Plan** out your truss beam layout in finer detail. Allow your general blueprint to guide you, but now you have to get down to arranging your popsicle sticks for actual construction. The trusses are the four beams that will run the length of the top and bottom of your bridge. Later, you'll add triangles to these for improved support. Use your blueprint to guide you as to how long to construct your beams.
 - i. Lay out **four** rows of Popsicle sticks with each row being **at least three sticks wide**. Each row should be equal in length.
 - ii. Cut four popsicle sticks in half. Place each of the halved popsicle sticks at both ends of each of the truss beams, in the middle position of the three-wide popsicle sticks.





4. Stack the three section of each row on top of each other and glue the stacks together to form 4 big rows.
 - a. Hot glue dries very quickly! For best results, press your popsicle sticks together as soon as the glue has been applied.
 - b. Press the popsicle sticks together and apply firm pressure so your trusses are securely glued.

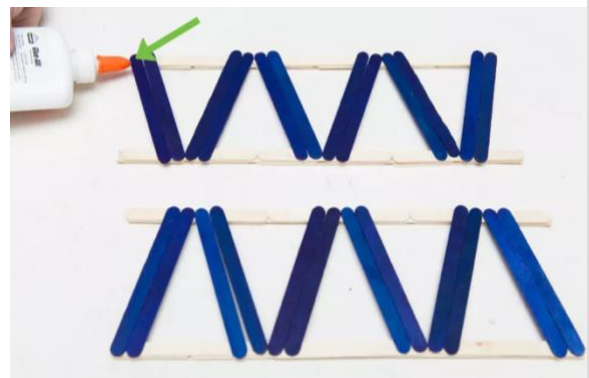


5. From your blueprint, lay out the popsicle sticks on top of your drawing for the triangle set up. The triangle portions are called the **cross supports**. For the purposes of this model, you will be using two sticks side by side in a W pattern
 - a. The more bracing you have, the stronger your bridge will be. However, too many popsicle sticks might make it difficult to see anything move across the deck of your bridge.

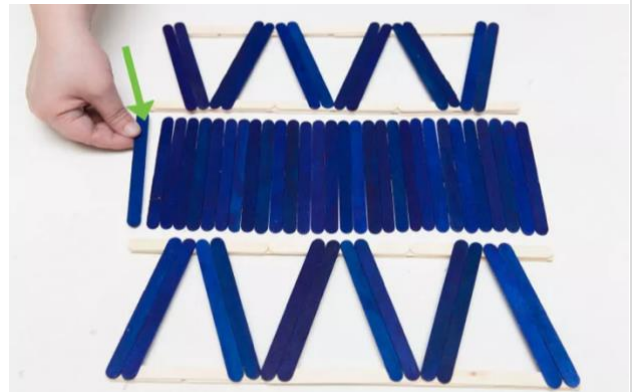




6. **Unite the beams of your trusses.** With the W pattern marked out, you should be able to determine how many popsicle sticks you will need. Count out the appropriate number to have at the ready, and:
- Position your popsicle sticks along the truss beams before gluing to verify the final structure of the wall truss.
 - Use hot glue, or another suitable glue, to adhere the popsicle stick cross braces to the truss beams.

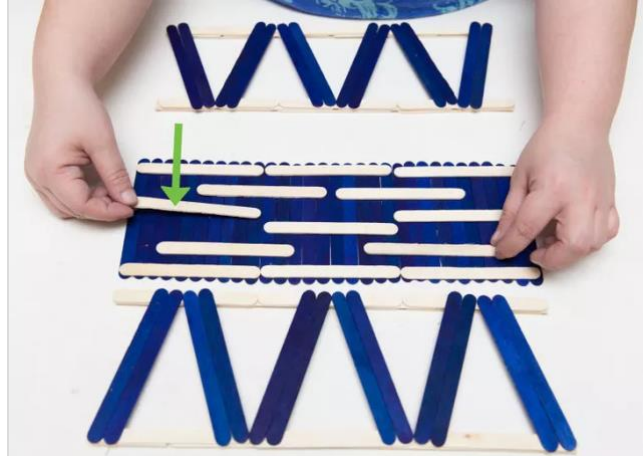


7. **Lay out the deck of your bridge.** Set your two trusses flat on your workspace so that each lay parallel. Then, take your popsicle sticks, laying several between each of your trusses. These will form the deck, or the road, that runs the length of your bridge between the truss walls. Lay out popsicle sticks until your deck stretches the distance of the trusses. You can choose how wide you want to make your bridge! See picture for clarification.
- Be sure that all of your popsicle sticks are even, otherwise the deck leading over your bridge will look irregular.
 - Glue** the deck after you have finished laying it out!





8. **Optional:** To make the deck of the bridge stronger **glue popsicle sticks to the back** in an irregular pattern. Make sure it is flat! Then glue them on the deck.



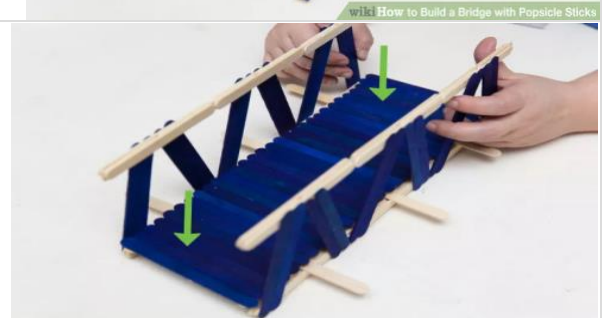
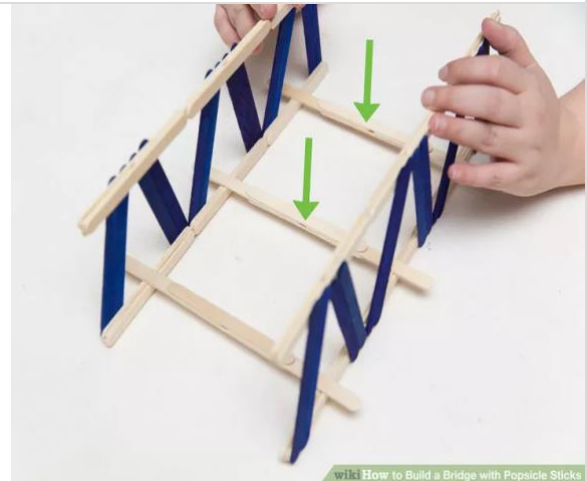
9. To add cradle supports, measure how wide you want your bridge.

10. Multiply the width of your truss measurement by two to account for the width of both trusses and then add the width of the deck

11. With glue, join the Popsicle sticks in a straight line. Make sure it's a bit longer than the width of your bridge.

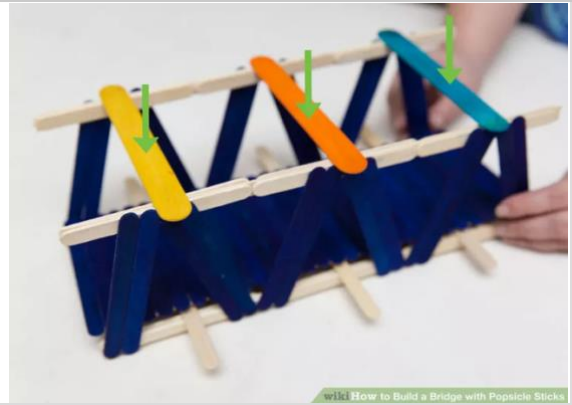
12. Finally, glue the cradle support to the sides of the bridge. Do it on both sides and in the middle!

13. Add the **deck of your bridge** on top of the cradle supports





14. **Finally add upper support beams.** This will be done by placing popsicle sticks at the top of the bridge to join your side frames. Add as many support beams you feel are necessary!



Instructions and photos adapted from: "How to Build a Bridge with Popsicle Sticks." *WikiHow*. Creative Commons, n.d. Web. 18 Nov. 2016.