

INNOVATION WYRKSHOP

BRIDGE CHALLENGE



ESTIMATED TIME: 1-2 HOURS

LEARNING OBJECTIVES

- Learn the history behind bridge designs
- Create a suspending bridge that is at least 1 foot in length
- Reflect on how your bridge design impacted the weight your bridge held

LEVEL: 1

STANDARDS

- NGSS
 - Developing possible solutions ETS1:B
 - Optimizing the design solution ETS1:C
- PBL
 - A challenge or problem
 - Authenticity
 - Reflection
 - Critique and Revision
- ISTE
 - Innovative designer 1.4.c, 1.4.d
 - Creative Communicator 1.6.a, 1.6.b

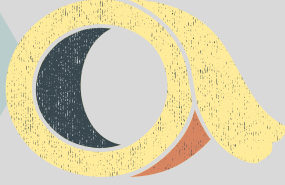
MATERIALS NEEDED:



Popsicle Sticks



Hot Glue Gun



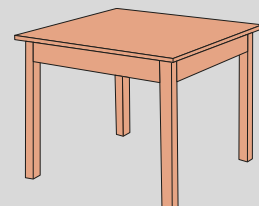
Masking Tape



Weights



Ruler



Tables



ACTIVITY OUTLINE:

INTRODUCTION:

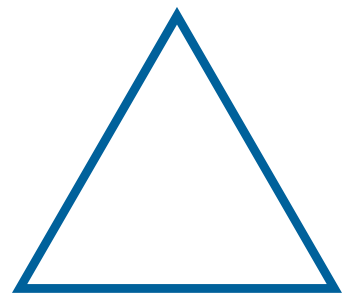
Bridges are used to connect the gap between two sides. They are super helpful because they let people and vehicles go from one side to the other without having to jump over or swim across the gap. You might see bridges over rivers, valleys, or even roads!

Engineers design bridges to have specific shapes and structures that make them really strong and long-lasting. One important shape for bridges is the arch.

An arch looks like a curved rainbow when you see it from the side. Arches are fantastic at spreading the weight of everything on the bridge evenly.

When cars, trucks, or people walk on the bridge, the arch shape helps the bridge handle all of the weight without breaking. The weight pushes down on the arch, but the arch pushes back and keeps everything steady.

Another cool shape is the triangle. Triangles are super strong building blocks. Many bridges have triangles hidden inside them. These triangles help the bridge stay sturdy and not wobble. If you try to push on a triangle, it stays firm and doesn't bend easily. That's why triangles are perfect for making bridges strong.



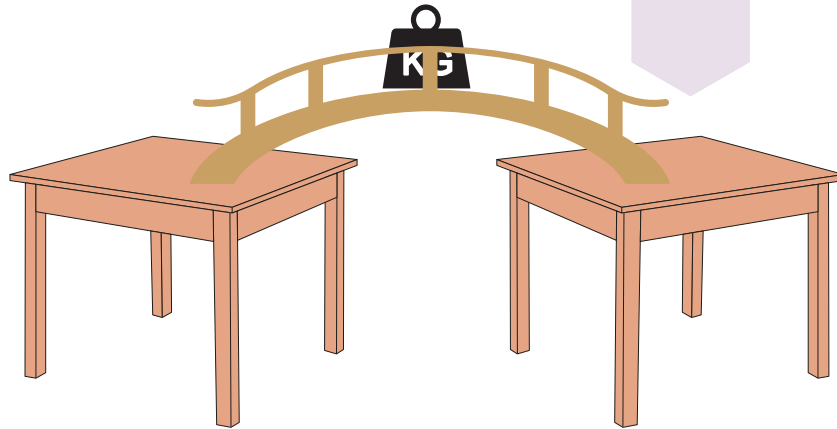
BUILDING A BRIDGE

Are you ready to build a super cool bridge? Let's begin! You can only use the materials listed above, that's what makes this a bridge "challenge". Use your newfound knowledge to create your own bridge, remember it must be at least 1 foot apart.



TESTING YOUR BRIDGE DESIGN

Now that you have built your bridge, its time to test it! Span your bridge between two tables. Once it is in place, start placing small weights in the center. The center of the bridge has the highest likelihood to break first, so place your weights slowly.



If your bridge is about to break, you can stop adding in new weights. Did the bridge meet your expectations? If not, no worries! You can always go back and redesign it. Remember, a masterpiece takes multiple try's and attempts, with every redesign this will get better!

