

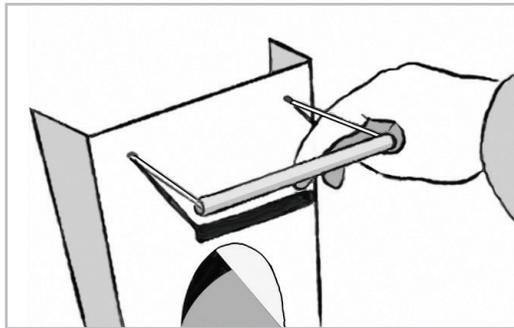
Build a Draw Bridge

MATERIALS

- An empty cereal box
- String
- A straw
- Scissors

INSTRUCTIONS

1. Remove the top of a cereal box. Separate the back of the box from the front and sides by cutting along the folds from top to bottom. Make sure to leave the back of the box attached to the base.
2. On the front of the box, cut out an archway opening. This will be the entrance.
3. Poke two holes at the top of the front and two holes at the top of the back of the box, one on each side (four total).
4. Lace the string through the holes. Push the string through the straw and cut the string to the desired length for opening and closing your draw bridge.



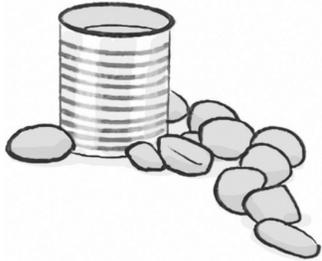
Drawbridges were often used during the middle ages to prevent entry into fortresses. Those on the inside could pull up the bridge, blocking the entrance to invaders.

Draw bridges are still used sometimes today. The draw bridge raises up to allow boats with tall masts to pass below.



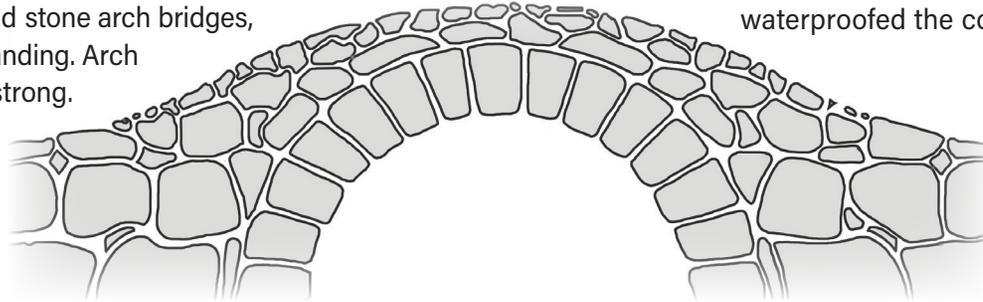
Find more activities at www.christyhale.com

Make a Roman Arch with mortar



The Romans were the first major bridge builders of the world. They created more than one thousand stone arch bridges, many still standing. Arch bridges are strong.

The Romans used volcanic ash as one component of their cement. This waterproofed the concrete.

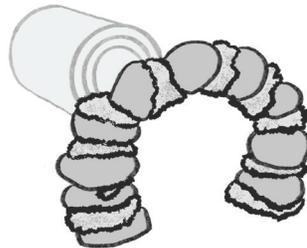
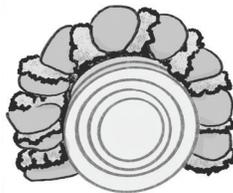


MATERIALS

- Stones of similar size and shape
- 1/2 cup cornstarch
- 1/2 cup of sand
- 1/2 cup of boiling water
- Can for centering the arch
- Gravel for concrete

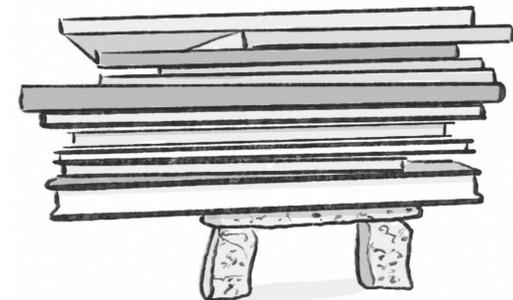
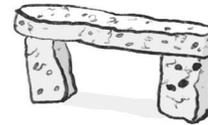
INSTRUCTIONS

1. Prepare the mortar by mixing the cornstarch, sand, and boiling water. Stir until thick.
2. Use enough mortar between the stones to hold them together and bind them in an arch around the can. Centering distributes the weight and holds up the stones before the keystone is placed.
3. Remove the can. The arch should stand. Compression holds the sides in against the keystone and help distribute the weight away from the center, down the sides, and into the ground.



Make a Beam Bridge with concrete

4. Add gravel to the mortar, form the concrete into some posts and beams, place these on aluminum foil, and bake them at 275 degrees for 45 minutes.
5. Test the strength of this simple material.



Find more activities at www.christyhale.com

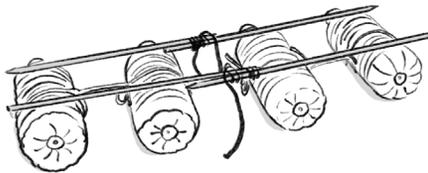
Build a Pontoon Bridge

MATERIALS

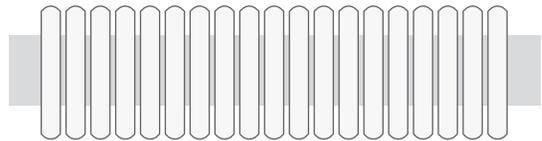
- Water bottles (for pontoons)
- Skewers (for "balks" or side rails)
- Popsicle sticks (for planks)
- Duct tape
- Yarn or string

INSTRUCTIONS

1. Bring the supplies to a park with a stream. Measure the width of the stream.
2. Assemble the pontoons, lashing them together with yarn or string.
3. Create long balks from shorter skewers. Lash the balks to the pontoons.



4. Position popsicle sticks side by side and secure them on a strip of duct tape. Then lash these chess planks to the balks below.



A pontoon bridge is a temporary structure made from floating components that support a deck for crossing water. Used frequently in military operations and emergency situations, they can be built quickly and have flexibility.



Find more activities at www.christyhale.com

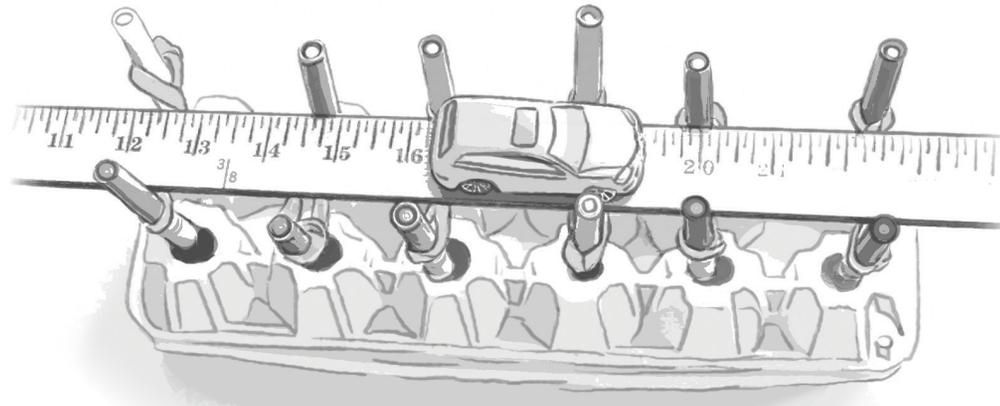
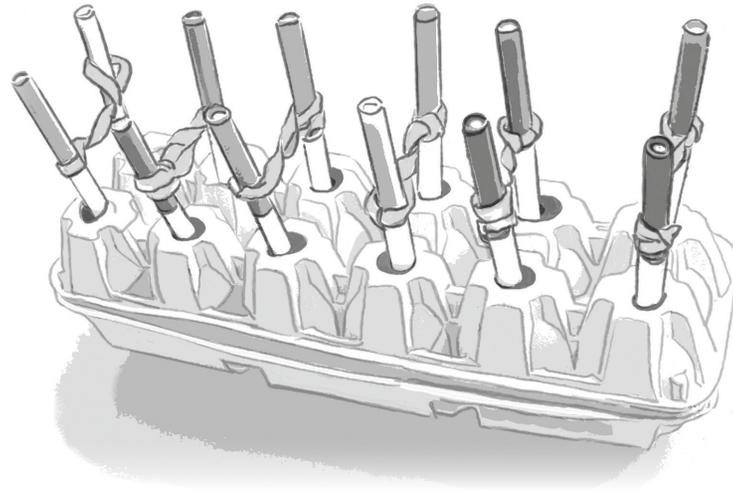
Build a bridge with **Everyday Items**

MATERIALS

- An egg carton
- 12 markers (or pencils)
- 6 rubber bands
- A ruler
- A toy vehicle

INSTRUCTIONS

1. Flip an egg carton upside down and poke holes in the center of each egg section.
2. Insert a marker into each hole.
3. Loop a rubber band around the marker, twist it twice, then loop it around the marker directly across, making six sets of supports for the bridge deck.
4. Position a ruler on top of the rubber bands. Drive your toy vehicle across the bridge.



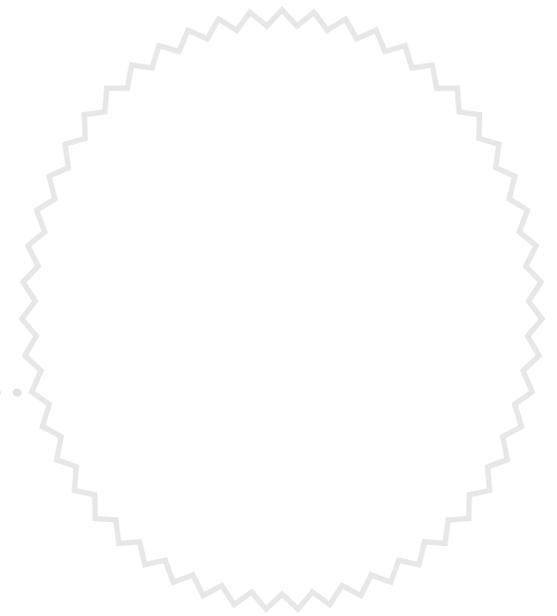
Find more activities at www.christyhale.com

Design a Bridge

between your two favorite places



DRAW YOUR FAVORITE PLACE



DRAW ANOTHER FAVORITE PLACE

DESIGN YOUR BRIDGE

Find more activities at www.christyhale.com

Reaching Across the Sky A Celebration of Bridges • **Christy Hale** • Christy Ottaviano Books/Little, Brown • ISBN 9780316575478