



Welcome to our 2020 STEAM Camp! Next year we hope to be able to see all of your bright shining faces in person again, but until then we have brought STEAM camp to your door. Have a great time exploring Science, Technology, Engineering, Art and Math with these fun activities designed just for you.

This kit includes written instructions for the activities listed, as well as videos to help you. Visit your website [www.kidsdiscoveryfactory.org/steam-camp](http://www.kidsdiscoveryfactory.org/steam-camp) and follow along with us, or choose when to do activities based on your schedule.

Throughout the week we would love for you to share with us your creations.

- If sharing on Twitter please use the hashtag #KDFSsummerSTEAM and tag us at @KidsDiscoveryIN
- If sharing on Facebook please tag use the hashtag #KDFSsummerSTEAM and tag us @KidsDiscoveryFactory
- If Sharing on Instagram please use the hashtag #KDFSsummerSTEAM and tag us @kidsdiscoveryfactory
- Or you can email photos to us at [vanessa@kidsdiscoveryfactory.org](mailto:vanessa@kidsdiscoveryfactory.org)

Thank you for your continued support of Kids Discovery Factory.

**Day 1:**  
**Builder's Bingo**  
**Tie Dye Camp Shirt**  
**Pumping Heart Model**

**Day 2:**  
**Bristle Bot**  
**Geo Strings**  
**Water Wheel**  
**Museum Designer**

**Day 3:**  
**Robot Hand**  
**Roller Coaster Design**  
**Splatter Art**  
**T-Shirt Roll Call**

**Day 4:**  
**Grabber**  
**LED Sculpture**  
**Stress Ball\***

**\*Requires some prep the night before.**

## **Day 1**

### **Builder's Bingo (30 min)**

Supplies:

Builder's Bingo Card

Building Cogs

Directions:

Choose 5 activities on the Builder's Bingo card to create vertical, horizontal or diagonal lines, to create a BINGO! Each activity listed on the card is a suggestion on what you can create using your Building Cogs. You may have to reuse cogs.

We would love to see examples of what you created!

### **Tie Dye Camp Shirt (30 min, 24 hrs wait, Rinse and Wash & Dry 2 hrs)**

Supplies:

Camp Shirt

Die Bottle

Rubber Band

Gloves

Gallon Ziplock Bag

Directions:

This activity will require an adult's help.

Step 1: Prepare your workspace. This activity is best done outside to avoid messes. If working inside make sure all surfaces are covered.

Step 2: Prepare your Ink. Add water to ink bottle.

Step 3: Prepare your T-shirt. Below are three examples of how you can fold your shirt.

Step 4: Take your prepared ink and squirt it on prepared shirt. Don't forget to turn your shirt to cover all sides.

Step 5: Place your ink soaked shirt in a plastic Gallon Ziplock bag overnight.

Step 6: Wait 24 hours.

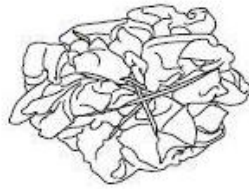
Step 7 & 8: Without removing the rubber bands have an adult rinse your shirt until the water runs clear.

Remove rubber bands and rinse again. Wash and Dry your camp shirt alone to set the dye. Wear your shirt on Wednesday (Day 3).

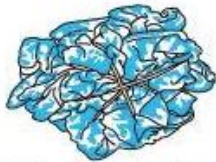
# Crumple



Scrunch fabric using both hands



Loosely band together with rubber bands



Randomly apply single color to slightly damp shirt, leaving white areas



# Folding



Evenly accordion fold garment



Bind with rubber bands

Accordion fold shirt lengthwise; wrap with rubber bands according to diagram at left, and apply single color overall



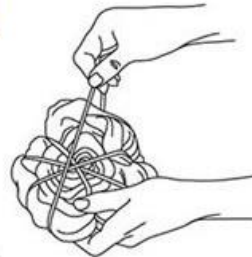
# Spiral



Pinch and begin to twirl fabric where you want the center of the spiral to be



Continue twirling fabric until entire garment or item forms a spiral



Wrap with rubber bands



Apply single color to center areas of banded sections on slightly damp shirt



## Pumping Heart Model (30 min)

Supplies:

3 Clear Cups

Water

2 Balloons

2 clear straws

2 bendy straw

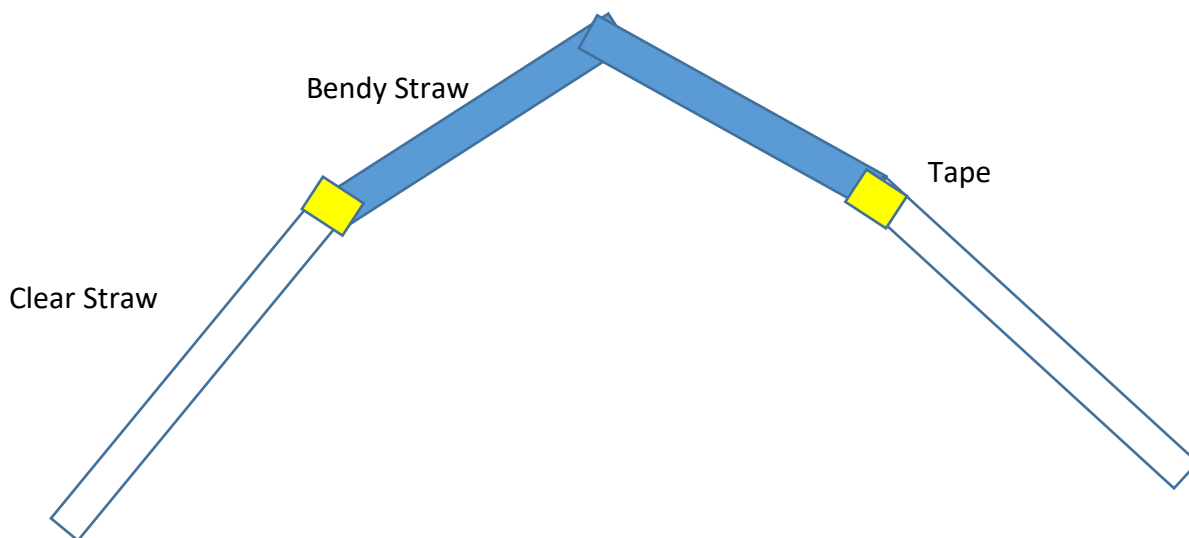
Tape

\*Scissors

Directions:

Cut the end off of both balloons. Take one of the balloon ends that you cut off, and tape the cut end shut.

Cut one of your clear straws in half. Take your bendy straw and cut it so that each end only has about 2 inches of straw. Insert half of the cut clear straw into each end of the bendy straw, and tape them together.



Take the balloon end that you had cut off earlier, and cut a small slit in the center of one of those. Place one of the balloon ends onto the top of the whole clear straw.

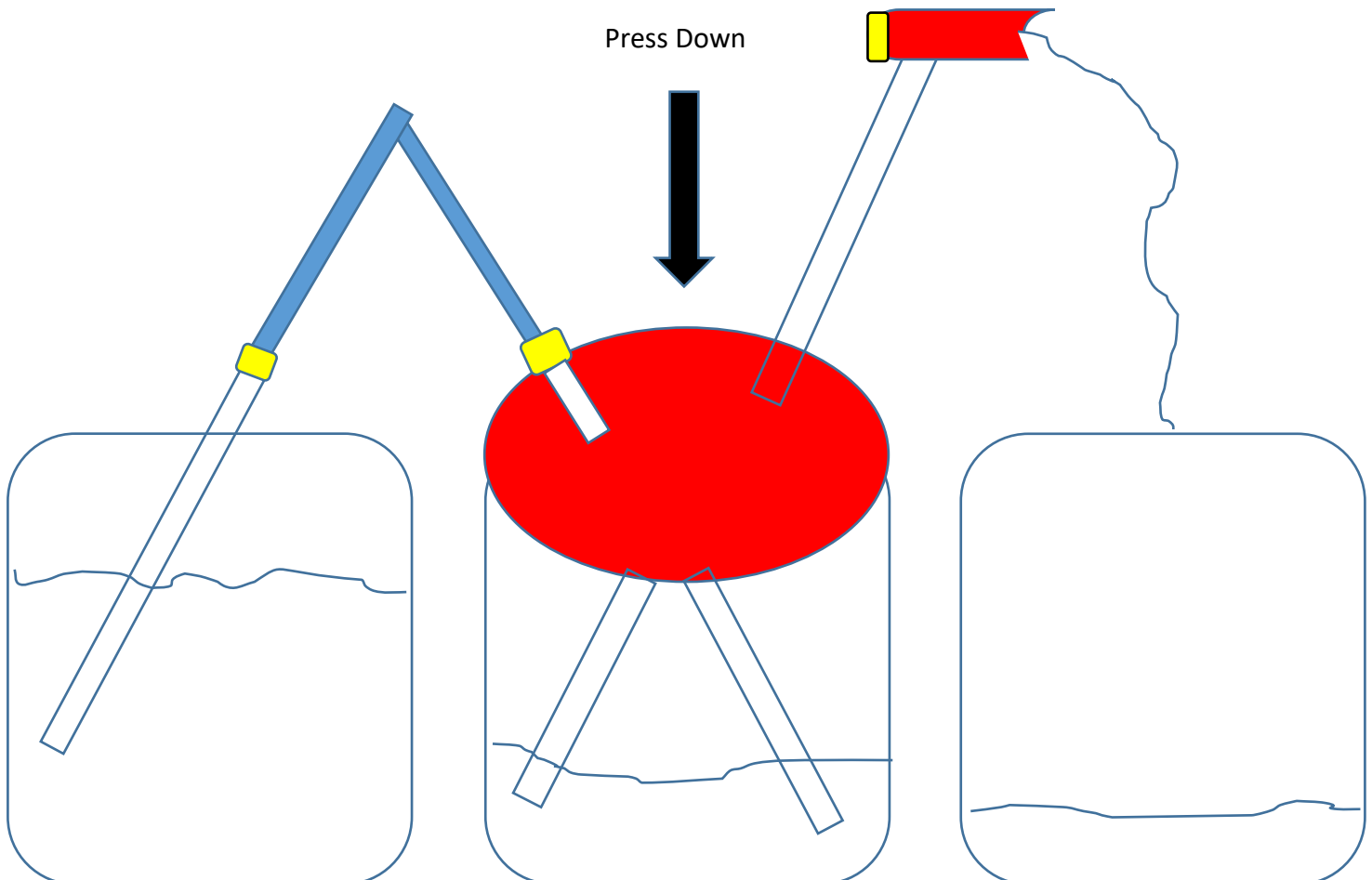


Line up your three cups. And pour water into the first two cups. (Optional: Add red food coloring to the water) Then take one of the balloons that you cut the end off of, and pull that as tightly as you can over the top of the middle cup.

Cut two very tiny slits into the balloon that has been stretched over the cup. One slit on the left side of the balloon lid and one on the right side. You want the slits small enough that the balloon will seal to the straws that you slide thru the slits.

Next place the straws as shown below into the three cups. The first cup should only have one end of the bendy straw in it, and the last cup should be positioned to catch liquid as it comes out of the balloon end on the top of the clear straw.

Push down on the balloon lid on the center cup. Watch your heart “pump” blood from one chamber to the body. If your “heart” is not pumping. Chances are that the holes in your balloon lid are too large and pressure is not being created when you pump. Remove the balloon lid and try again with the extra provided.



## Day 2

### Bristle Bot (15 min)

Supplies:

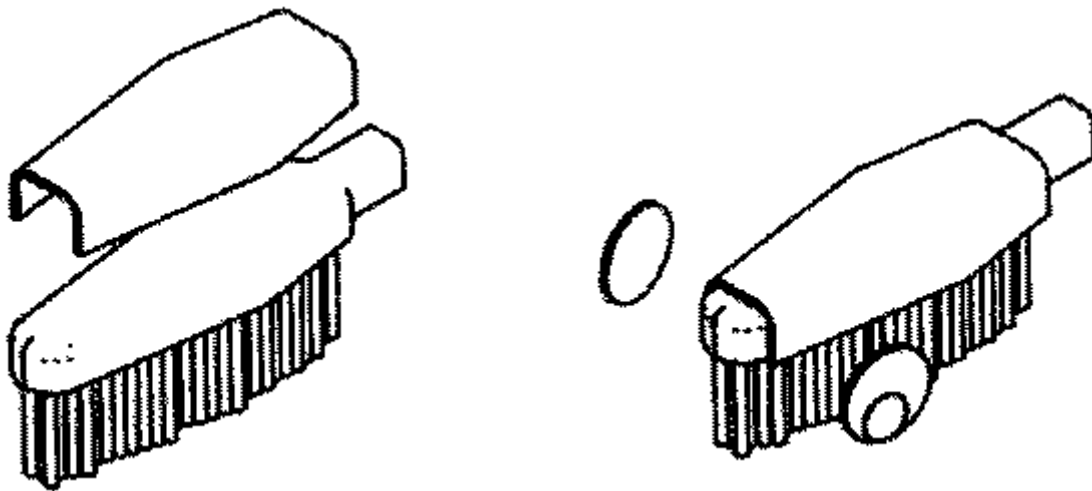
Toothbrush Head  
2 Google Eyes  
2 Pipe Cleaners  
1 Piece of Double Sided Tape  
1 Motor  
1 Battery

Directions:

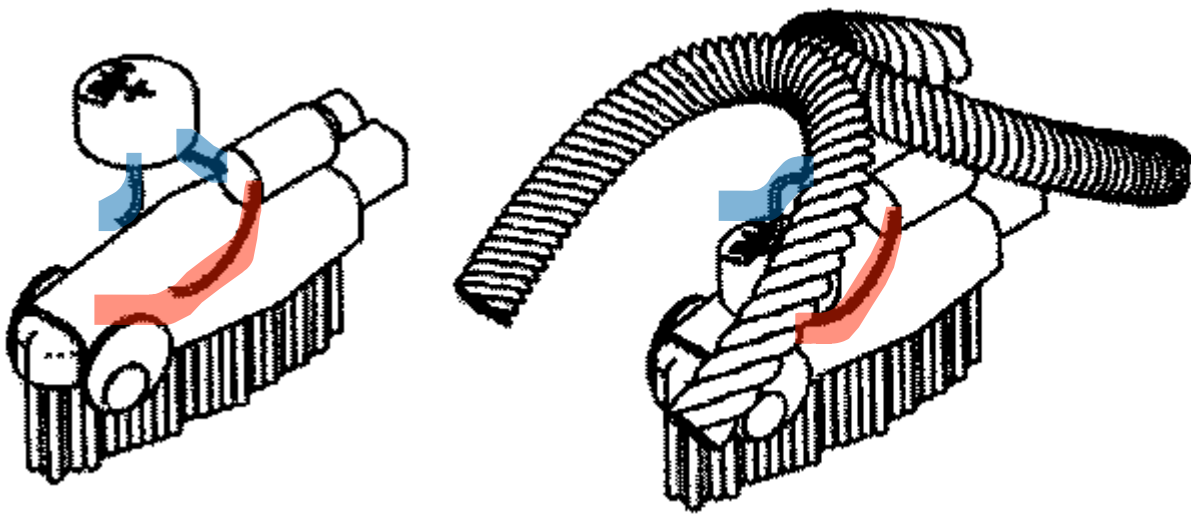
Cut the double sided tape into two pieces. One much smaller than the other. Cut along the dotted line shown below.



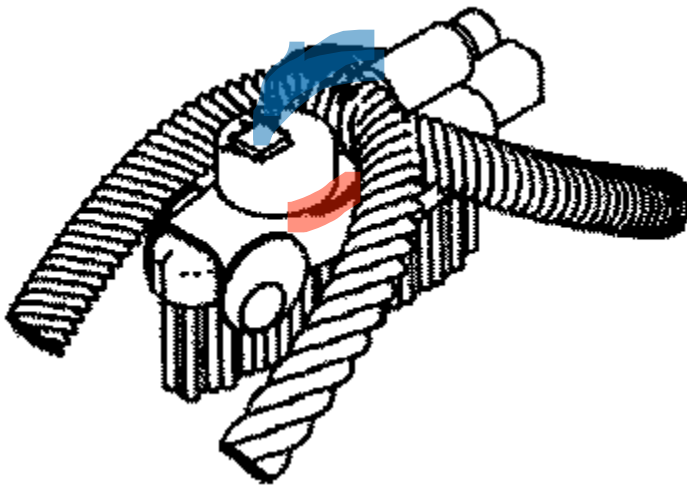
Take the larger piece of the double sided tape and stick one side onto the toothbrush head. Next stick on the google eyes to the same piece of tape.



Place the motor and battery onto of the toothbrush head, placing the red wire of the motor under the battery. Keep the motor's blue wire above the battery. Bend your pipe cleaner 'legs' and stick them to the tape between the red and blue wires.



Finally, take the small piece of double sided tape and use that to attach the blue wire to the top of the battery. This will create your circuit.



### Geo Strings (20 min)

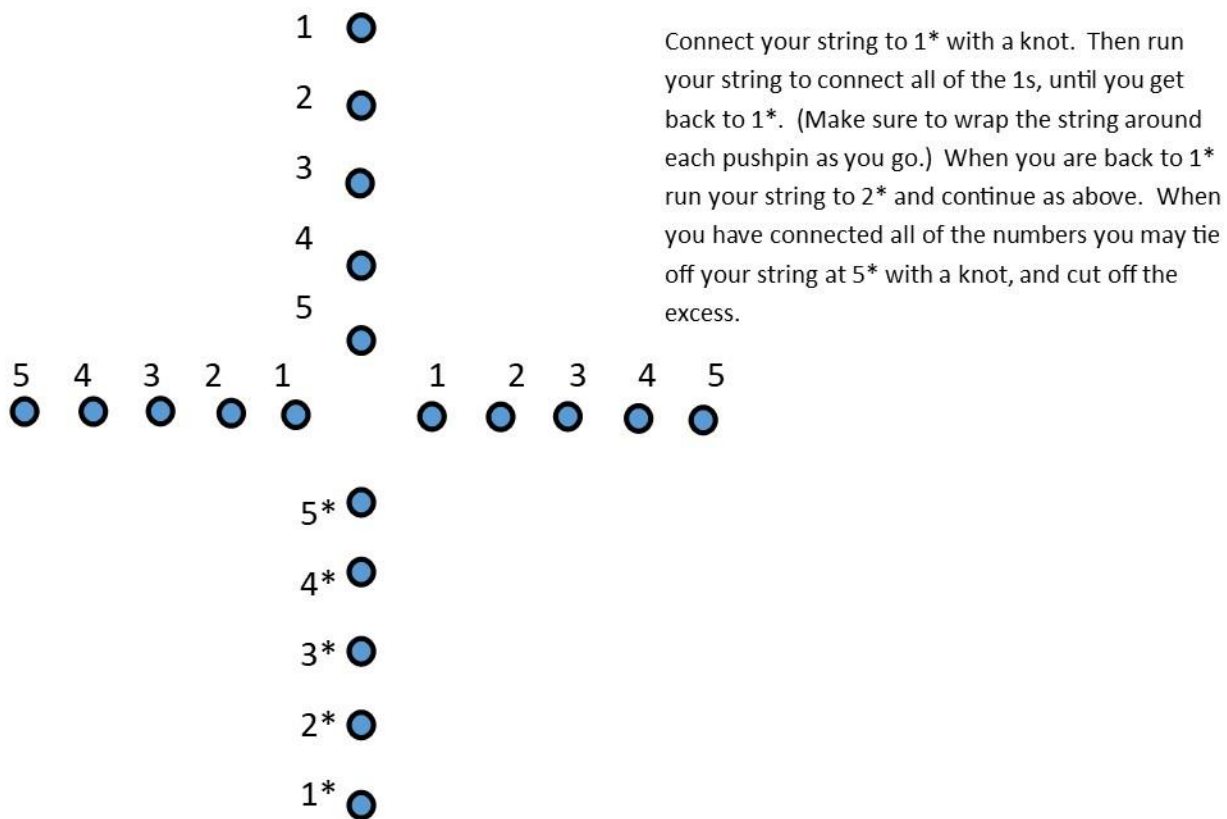
Supplies:

Styrofoam  
Nails  
Mallet  
String  
Pattern

Directions:

Place pattern on top of your foam. Take one pushpin and press a hole into the foam where indicated

on the template. Remove template. (If you cannot see the holes that you crated with the template, place the template back on the foam block take a marker and color over the template holes. This will create an easier pattern to see.) Place pushpins in holes. Follow the order listed above to create Parabolic curves.



## Water Wheel (20 min)

Supplies:

Paper Cups

Paper

Masking Tape

Skewers

Directions:

Lay a paper plate upside down. Lay out your paper cups so that they face outward and fill most of the plate. Tape cups to plate.

Use the tape to attach the remaining, so the plate faces the outside, to the cups.



Take your skewer and pierce it thru the middle of both plates so that your water wheel will turn along it as an axis.

Take your water wheel and place it under a faucet and watch the power of water.

## **Museum Designer (20 Min)**

Supplies:

Paper  
Envelope  
Crayons/Markers\*

Directions:

On the blank piece of paper design your dream STEAM Museum Exhibit.

Place your name and age on the bottom of the page.

Mail us your design ideas!

## **Day 3**

### **Robot Hand (30 min)**

Supplies:

Card Stock  
5 Regular Straws  
1 Large Straw  
String  
\*Scissors

Directions:

Trace an oversized version of your hand (include your wrist) onto the cardstock and cut it out.

Lay your straws out on your paper hand. Cut 3 small sections, and one long section for each finger and thumbs.

(I find it easier to thread your yarn thru as you tape down your straw pieces instead of after.)

Tape your straw sections onto your paper hand.

Cut your large straw in half, and tape it onto the 'wrist' of your paper hand.

Thread your yarn thru the straws all strings will meet and go thru the large straw taped to the wrist.

Tape the strings to the back of the top of the hand.

Pull the strings to manipulate the now robotic hand.

## **Roller Coaster Design (40 min)**

Supplies:

Straws

Ping Pong Ball

Masking Tape

Cardboard Base

Directions:

Tape straws together and to your cardboard base to create a roller coaster that your ping pong ball will roll down. Suggestion: Start your ping pong ball at the top of your biggest hill, so momentum will carry your ping pong ball.

## **Splatter Art (20 Min)**

Supplies:

Acrylic Paint

Cotton Pads

Mallet

Paper

Directions:

Pour acrylic paint into pools on your paper. Place a cotton pad on top of your paints. Take your mallet and smash. Watch the force splatter your paint.

## **T-Shirt Roll Call (10 Min)**

Supplies:

You

Camp Shirt

Directions:

Have a parent/adult take a picture of you wearing your completed Camp Tie-Dye Shirt. Email or Txt that photo to [vanessa@kidsdiscoveryfactoryl.com](mailto:vanessa@kidsdiscoveryfactoryl.com) or 812-212-4080. We would love to create a gallery with all of our proud campers!

## Day 4

### Grabber (40 Min)

Supplies:

Craft Sticks

Straws

Skewers

Small Wood Sticks

Tape

\*Scissors

Directions:

We are going to build and strengthen our beams. Take your large straws and cut each of them into equal quarters. You should end up with 8 equal straw pieces.

Next take your craft sticks and place one craft stick into each end of 4 of your straw pieces. Leave a small gap where your two craft sticks meet. You will end up with four beams like this:

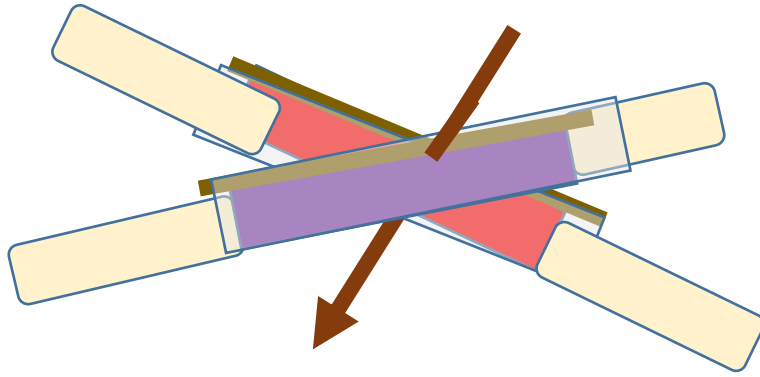


Take your small wooden sticks, and tape it along the top-side of the straw portion of your beam.

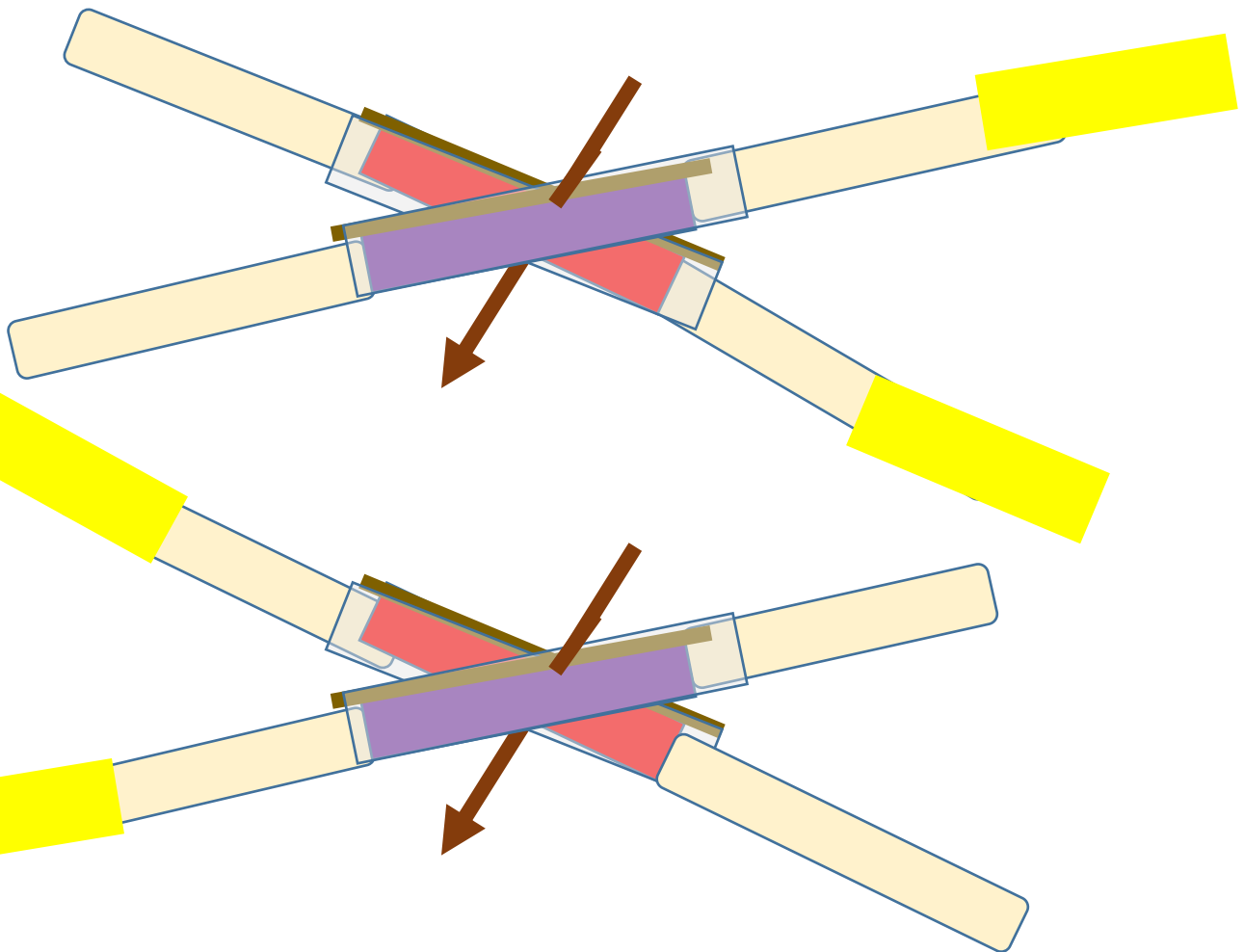


Repeat this step with all four beams.

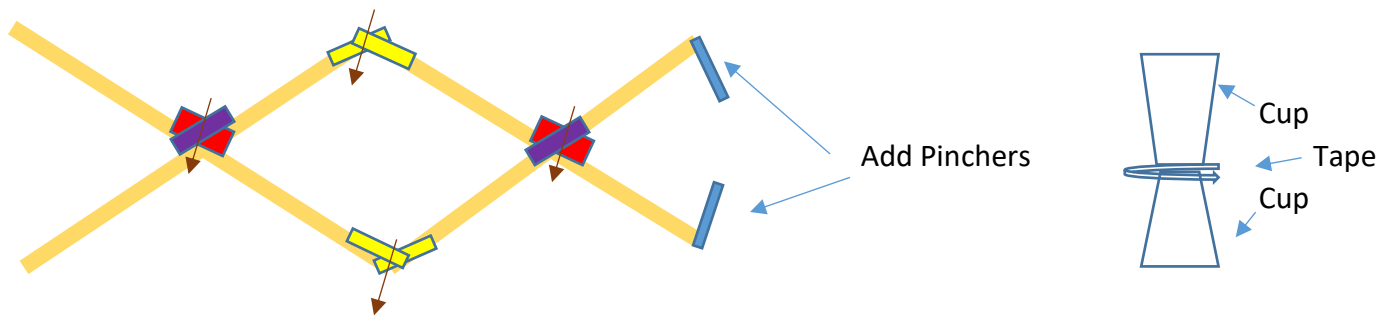
Next, we are going to connect the beams. To connect the beams you will first need to take one of the pointed ends of the skewer and pierce the center of the straw. With the skewer still inserted into the beam, use the same pointed end to pierce the center of the straw of a second beam. You will have created an 'X'. Now pull the skewer 1/2 way thru the 'x' and break it off so that you can reuse the pointed end to create another 'x'.



Once you have created two 'x's you will now connect them to each other. To do this add additional straw pieces to the ends of each 'x'



Once you have added the additional straw pieces to your 'x's you are going to use the same skewer trick that we used earlier to connect the two open ended straws. Leaving a bit of skewer in place to connect the 2 'x's. (see below).



The next step is to add the pinchers that go on the end of your extending grabber. Take your last remaining craft stick and break it in half. Tape each half to the end of your grabber.

Take your two paper cups and tape them together so the bottoms meet. Try picking up cup with your extending grabbers.

## LED Sculpture “Christmas in July” (20 min)

Supplies:

Green Pipe Cleaner

LED Light

Lithium Battery

Tape

\*scissors

Directions:

Cut off / Remove about 1/2 of an inch of the fuzzy covering from both ends of your pipe cleaners. You may have to use your fingers to pull off the fuzzy covering, if the covering is not removed from the ends of your pipe cleaners they will not conduct electricity.

Bend your pipe cleaners in the shape of a Christmas tree.... Or other shape if you prefer. (Just make sure that both top and bottom wires end up close to each other.

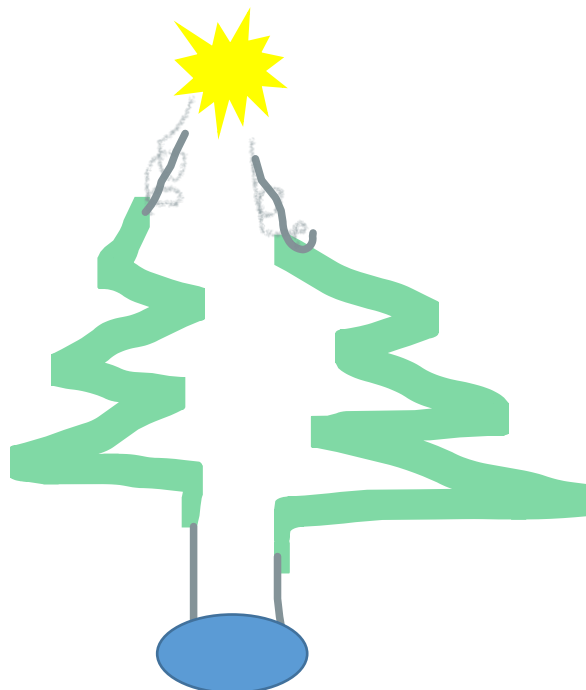


Next you want to look at your LED light. Notice that one of the metal leads is longer than the other. The longer end is the positive (+) end. Twist the positive lead around the top of one of the pipe cleaners, and the negative lead to the top of the other pipe cleaner. Note which is which.

Look at your coin battery. Find the positive (+) side. It will be labeled with a '+'. Tape the bottom of the pipe cleaner that is connected to the positive (+) side of the LED to the positive side of the coin battery.

Tape the bottom of the pipe cleaner that is connected to the negative side of the LED to the negative side of the coin battery.

Your sculpture should now be lit. You have created a circuit!



## **Water Bead Stress Ball (Prep Night Before 5 min - 10 min activity)**

### **Supplies:**

Small Water Bottle

Water Beads

White Balloon

Paper Triangle

### **Directions:**

\* Water Beads can be messy, parents might choose for campers to complete this activity outdoors.

Take your Paper Triangle, roll it into a cone, and tape one edge to keep it in place to create a funnel.

Take the lid off the water bottle, and use the funnel to put the dry water beads into the full water bottle. Leaving the cap off of the bottle place the bottle in a bowl or over a plate and let sit for several hours for the beads to expand. Some beads may overflow the bottle. (If you close the water bottle while beads are expanding, you may create pressure inside the bottle, and beads will spurt out when opened.)

Partially inflate the balloon, place the balloon's opening over the water bottle's opening and pour the water beads into the balloon. (Do not fill completely with beads as the balloon will be more likely to burst.)

Close the tie of your balloon. Squeeze lightly and enjoy!