

LYMAN ALLYN SCIENCE SATURDAY PRESENTS

# cubic bubbles

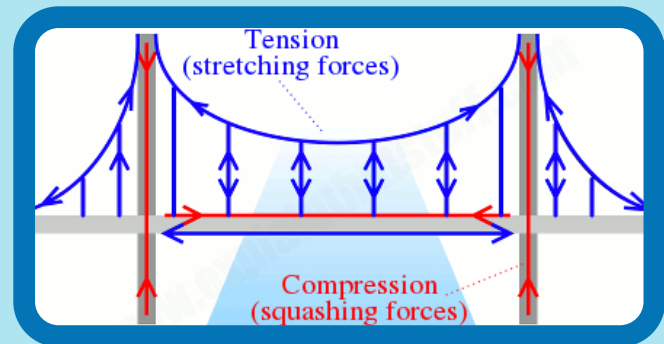
learn about **TENSILE STRUCTURES!**

## WHAT IS A TENSILE STRUCTURE?

A tensile structure is formed when a material is stretched and held in tension between two or more points. **TENSION** is a force that PULLS or STRETCHES. Imagine a rope during a tug-of-war. Both sides are pulling equally on the rope and exerting tension on the rope.



We see tension used by engineers all around us! One example of tension being used is in the suspension bridge. The weight of the bridge is spread out over the cables, which stretches the cables, putting **tension** on them.



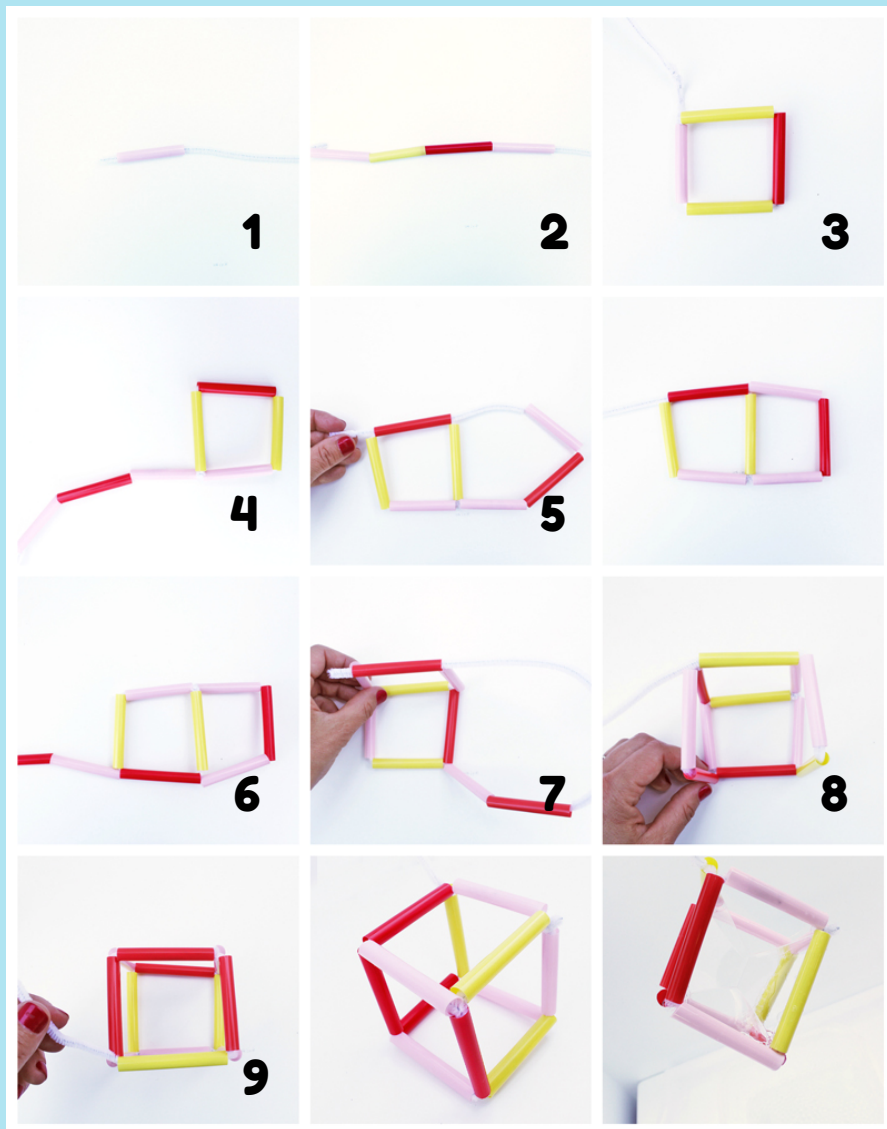
## HOW ARE CUBIC BUBBLES TENSILE STRUCTURES?



Remember, a tensile structure happens when a material is stretched and held in tension between two or more points. For this experiment, the material being stretched is the soapy solution, and it connects to the sides of the cube. The soap connects the shortest possible distance across the cube while still connecting all sides, forming the cubic bubble!

# HOW TO MAKE YOUR CUBIC BUBBLE WAND

1. Thread a pipe cleaner through one straw and bend the end of the pipe cleaner to secure it at the end.
2. Thread three more straws onto the pipe cleaner.
3. Bend the long end of the pipe cleaner back to meet the starting point and twist the two ends of the pipe cleaner around each other. You will now have a square shape.
4. Add three more straw sections onto the end of the long pipe cleaner.
5. Thread the pipe cleaner through one of the adjacent straw sections
6. Add two more straw sections
7. Bend the shape to form two sides of a cube and thread the end of the pipe cleaner through one of the straw sections on the edge of the cube.
8. Repeat Step 7 to form another side to the cube
9. Add one final straw section to complete the cube. Thread the pipe cleaner through an adjacent straw section to secure the final shape. If desired, add a straight section of straw onto the end of the pipe cleaner to form a handle.



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