

Practice Tips:

Mystery Architecture



TYPICAL MATERIALS THAT WE DISTRIBUTE: Practice with these at home!

You may want to assemble a “Practice Kit” with items like these. We give our participants very little tape – usually only about 1 foot of it – so be sure to practice making connections or attachments **without tape**. See the “Connections” section below for ideas.

1. PVC Pipe Segments Ours are made from 1” pipe and are about 1 foot long. The ends are **not** always flat or perpendicular to the length.
2. Printer Paper We often supply several sheets to each team. Be sure to practice making tubes or triangular columns that connect together.
3. Cardstock Sheets This is much stiffer and heavier than standard printer paper, so students have more building options. When included at the Olympiad, students generally receive a full sheet (8-1/2” x 11”).
4. Manila Folders This is similar in weight and stiffness to cardstock, but it already has a crease, obviously.
5. Hanging File Folders These are also made from something like cardstock, but they have two bonus components: the metal “arms” that stretch across the top of each side! These are easily removed and bent by hand into useful construction parts.
6. Paper Cups We often use large, round “Popcorn Cups” from when we had a machine running at weekend events. We avoid Styrofoam or plastic Solo cups.
7. Cardboard Disks At the 2019 Olympiad, groups will receive several corrugated cardboard circles, 4-3/4” in diameter, approximately 1/8” thick. Coaches who attended the Kick Off meetings in November received several for practice.
8. Wooden Dowels These vary in length, diameter, and number (and are sometimes not provided). We typically give each group of students at least three or four so that tripods or other structures are possible.
9. Wire Clothes Hangers Students can bend these with the pliers they are allowed to bring. We usually try to find the kind with a cardboard tube for the horizontal member. They allow participants to open up the hanger without trying to cut it.
10. Painters Tape We typically provide each group of students with 1” wide blue painters tape. The length varies between 1 – 2 feet.



USEFUL WORDS TO KNOW: Here are some representative words you should know.

Base	Platform	Tripod	Stability	Fastener	Zip Tie
Beam	Cantilever	Joint	Flexibility	Nut and Bolt	Slot and Tab
Girder	Column	Linkage	Rigidity	Machine Screw	Interlocking

USEFUL WEBSITES TO SEE: We verified these in January of 2020.

<https://www.youtube.com/watch?v=0954ThhDf44> (This uses only two sheets of paper and 6" of tape! Their weight is not a tennis ball, however. Teams need to bring their own scissors to cut parts.)

<https://sciencing.com/make-out-one-piece-paper-6284616.html> (Paper girder ideas)

https://learnxdesign.org/learnxdesign_record/dowels-and-rubber-bands-i/ (We give fewer dowels!)

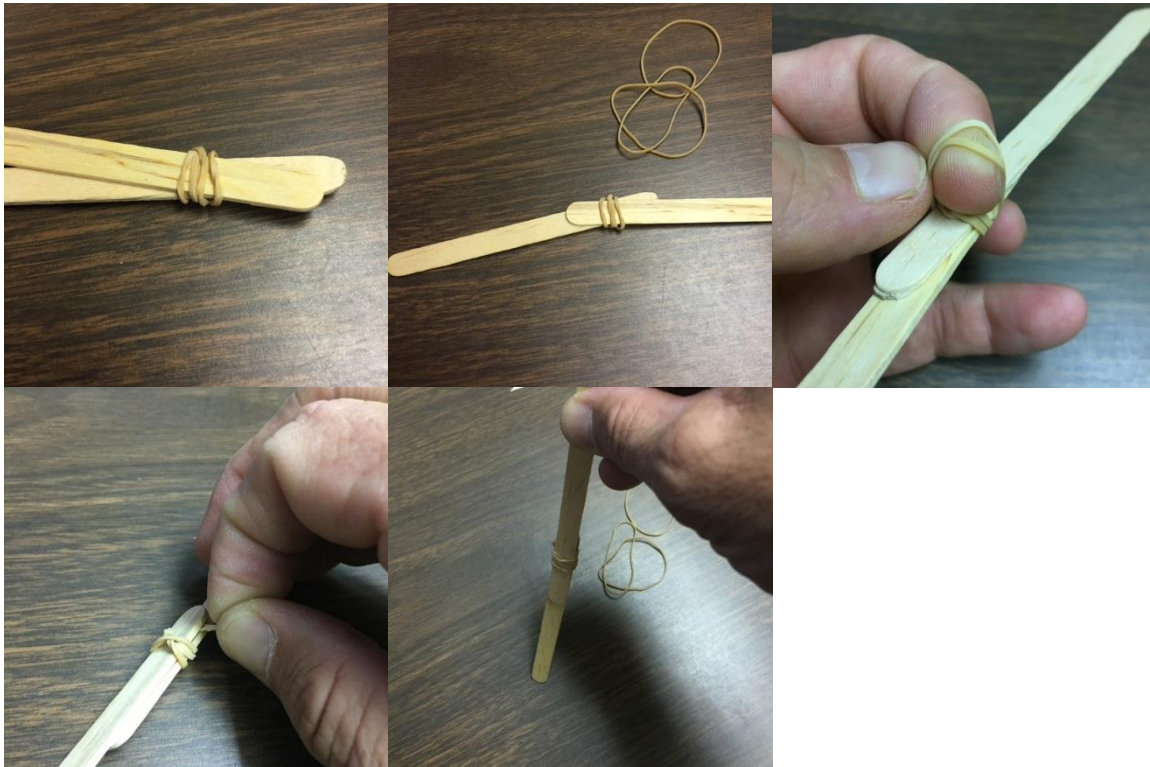
RULE CLARIFICATIONS: These apply only to DeKalb's Olympiad.

1. We allow a 30 minute building time after which all groups must stop. (The manual provides only 20 minutes.)
2. Students may bring their own scissors, rulers, and pliers. We **do not** supply these.

CONNECTIONS:

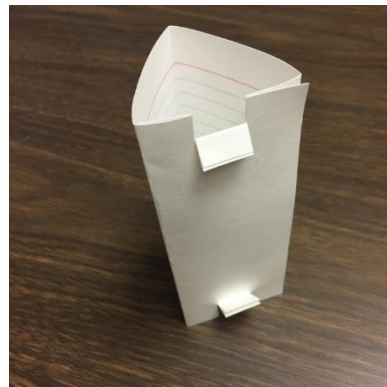
Here are some ideas for connecting typical parts **without any tape**. Can you come up with anything easier or better?

Extending a Popsicle Stick: (a) Lay two sticks side by side and loop a rubber band around one end several times. (b) Pull them slowly apart to extend your stick. (c) Pull up 2 or 3 of the loose loops . . . (d) and pull them around and into the crease between the sticks. (e) The resulting extended stick takes quite a bit of downward force before it slips!



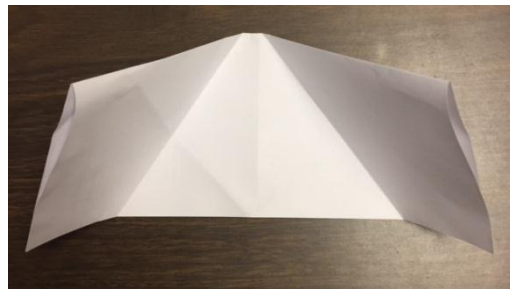
Triangular Cardstock Column with “Slot–Fold” Connection:

(a) Fold a note card or other stiff piece of cardstock paper into four equal parts. (Fold in half, then fold each of **those** halves in half again.) (b) Create the triangle by overlapping two of the four sides. At the center of your overlapped edges, cut two slits about 1 cm deep and 1 cm apart – you will need to cut **both** of the overlapped parts of the card. I folded each in different directions so you can see that they match up. (c) Fold both down and crease firmly. You now have a “slot” on top and bottom, and the triangle is held together by the “fold.”



Dowel Rod Base:

(a) Fold a sheet of printer paper in half, then fold in on the left and right sides as indicated. Notice how the secondary folds don't meet in the middle? That will leave a hole for my dowel rod!



(b) Fold along the secondary creases you just made, then cut the bottom edge so your base will sit nice and flat on the table or floor.



(c) Fasten the base together at the front by using a “slot–fold” connection like the one described above. Cut a slit on the back so the dowel can slide through it. Insert your dowel rod through the top, and gently guide it through the slit on the back.

