

Awana Trebuchet Contest

Chili Cook-Off and Cookie Bake-Off

Saturday, April 1, 2017

10:00 AM in the Faith Community Church Gym

Lunch will be provided: Chili, Hot Dogs, Corn Chips, Drinks, Baked Goods, Pop Corn, Cotton Candy

All Workshops will be held in the Gym:

Saturday, January 28th 12:00-2:00 PM in the FCC Gym

Saturday, March 18th, 12:00-2:00 PM in the FCC Gym

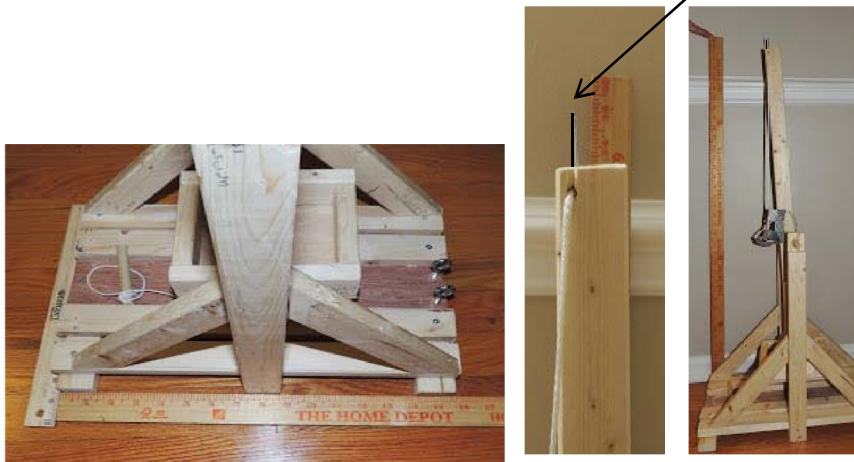
Tuesday, March 21st, 6:00-8:00 in the FCC Gym

Mandatory Pre-Registration and Impound

Wednesday, March 29th, in the FCC Gym

Contact Ken Allen 302-222-6482 or Nancy Saba 302-535-0697 for questions about this event. Questions about how you can be involved on the day of the event.

Trebuchets must be measure to make sure they do not extend the size requirements, which are; no taller than 36" to the tip of the release pin, no longer 18" in length, and no wider than 12".



Categories are: Sparks (children age K - 2nd Grade), T&T (children in Grade 3rd - 6th) and Open Class (anyone who does not fit in either of the two age groups)

Sparks (children age K - 2nd Grade)

Design – will be scored by using scores from contestant and spectators. Everyone can pick their top 3. Scores will be awarded 3 points for 1st, 2 points for 2nd, and 1 point for 3rd. Top 3 scores will get prize.

Accuracy – will be determined by using the distances of 25, 35, and 45 feet. There will be a large bullseye, and points awarded for closest to the center. The outer ring will be worth 5 points, moving inward, the fourth is 10, third is 15 second is 20 and the center is 25. Maximum score per round is 50 and maximum score per competition is 150

Distance – will be determined outside by furthest distance payload goes striking the ground the first time.

Sparkies may have assistance from a family member, but will have a 1 minute time limit to launch when told they are on the clock.

Truth & Training (children in Grade 3rd - 6th)

Design – will be scored by using scores from contestant and spectators. Everyone can pick their top 3. Scores will be awarded 3 points for 1st, 2 points for 2nd, and 1 point for 3rd. Top 3 scores will get prize.

Accuracy – will be determined by using the distances of 25, 35, and 45 feet. There will be a large bullseye, and points awarded for closest to the center. The outer ring will be worth 5 points, moving inward, the fourth is 10, third is 15 second is 20 and the center is 25. Maximum score per round is 50 and maximum score per competition is 150

Distance – will be determined outside by furthest distance payload goes striking the ground the first time.

T&T'ers must operate their trebuchet by themselves, and have 30 seconds for each shot when told they are on the clock.

Open Class (anyone who does not fit the other age groups)

Design – will be scored by using scores from contestant and spectators. Everyone can pick their top 3. Scores will be awarded 3 points for 1st, 2 points for 2nd, and 1 point for 3rd. Top 3 scores will get prize.

Accuracy – will be determined by using the distances of 25, 35, and 45 feet. There will be a large bullseye, and points awarded for closest to the center. The outer ring will be worth 5 points, moving inward, the fourth is 10, third is 15 second is 20 and the center is 25. Maximum score per round is 50 and maximum score per competition is 150

Distance – will be determined outside by furthest distance payload goes striking the ground the first time.

Open class must operate their trebuchet by themselves, and will have 30 seconds for each shot when told they are on the clock.

Competition

To begin the competition, the middle of the firing target ring will be placed at a distance of 25 feet from the firing line.

Each competitor is allowed 2 shots from each of 3 different distances.

After each competitor, has taken his two shots at that distance, the target is then moved to the next distance.

Shots 1&2 will be shot from a distance of 25 feet

Shots 3&4 will be shot from a distance of 35 feet

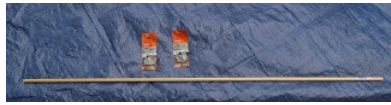
Shots 5&6 will be shot from a distance of 45 feet

After each competitor has completed 6 shots the scores from each shot will be added together and the highest score will win the accuracy competition.

How to Make a Trebuchet for about \$12



(3) Three 1"x2"x8"



(1) One Wooden Dowel (7/16" x 48")

(3) Three packs of #6 x 1 1/4" wood screws (10 in each pack = total 30 screws)



(1) #6 - 1/2 inch screws



(1) 2" x 16" piece of flat board and 1 6"x 6" piece of flat board.

Tools you may needed:

Miter Box and Saw

Drill and Phillips Head screw driver bit

Measuring tape or yard stick

1 Bottle wood glue

Step 1



Once you have assembled all of the required supplies and tools; Cut 6 pieces each 16" long

Step 2



Cut 2 pieces, one 10" long and one 9" long. You can also do 3 pieces at 10" and it will not affect the total outcome, but I left room in this one on the outside as you will see.



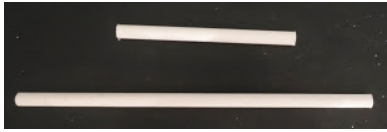
Step 3



Create the base of the trebuchet by gluing together the 16" pieces' length wise on top of the 10" pieces. Add the 9" pieces in the middle and at each end. It should look like this...

If you use 3 10" pieces you will not see the end of the board sticking out and the edges will be flush.

Step 4



Cut 2 lengths of the dowel - one 12" and one 6". Set aside to use later

Step 5

Make the upright supports. Glue the other two 16" pieces together, leaving room as shown, to fit onto the base. The distance is about a 1 1/2" difference at the top and bottom as shown. It is best to measure as shown in the second picture before gluing. Glue the pieces together as shown in the following pictures. Repeat this procedure for the other side.



Step 6



Once the glue has dried, drill a hole into one end of the supports as shown. The hole needs to be big enough to fit the dowel.

The side with the hole will be the top of the support.

Step 7



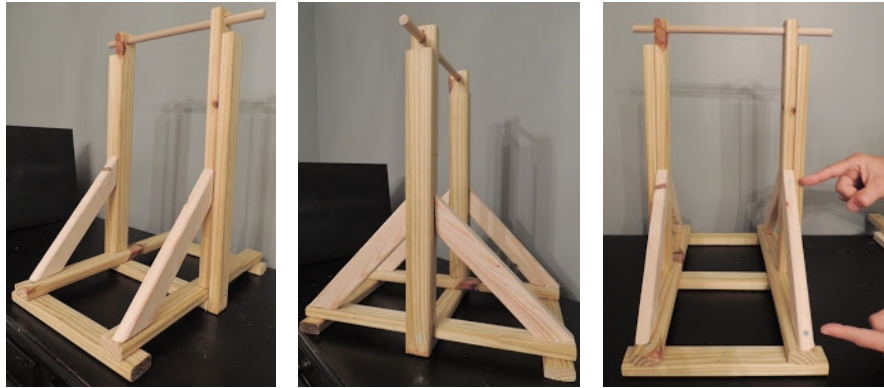
Glue the supports in place, and screw also them into place for added support (It is helpful to have the 12" dowel in place between the two supports to ensure proper placement)



Step 8



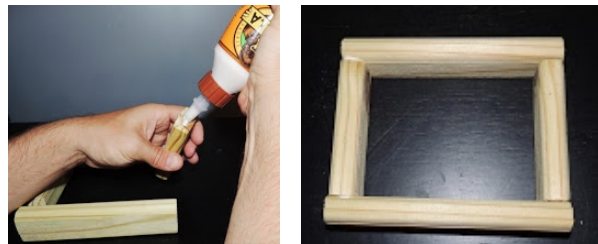
Cut 4 - 10" pieces with a 45 degree angle cut as shown below. Glue and screw them into place. These are the braces for the supports.



Step 9



Now to make the counterweight box. Cut 2 - 6 1/4" pieces and 2 - 3 3/4" pieces which will become the frame for the counter weight box. Glue and screw them together as shown.



Step 10

Cut 2 - 8 1/2" pieces.

1 1/2" from one end of each piece, drill a hole that is an appropriate size to fit your dowel.

With dowel in place between the two upright supports, glue and screw the brace supports into the middle of the box as shown with the drilled holes and with the 6" dowel in place to ensure proper position.



Step 11

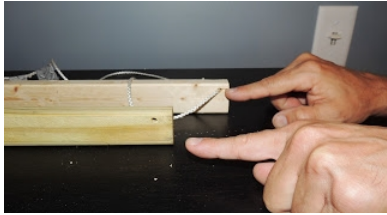


Finally use the 6" by 6" thin board to create the base for box and use the smaller screws to attach it. This board may need to be trimmed to fit flush.

Step 12

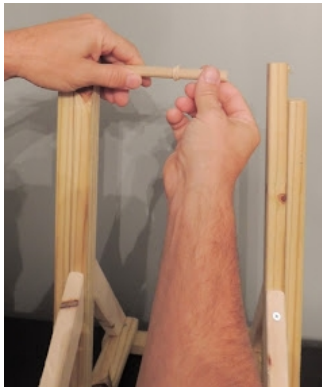


Creating and attaching the swing arm. Cut a 24" piece and drill two holes for a dowel - one hole at 1 1/2" from one side and the other at 6 1/2" from the same side as shown.



You will also need a smaller drilled hole at the opposite end and slightly offset to one side for attaching sling. Here you see one swing arm with the sling attached and one with just the hole.

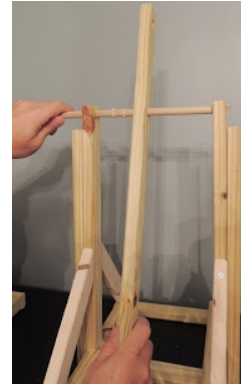
Attach the swing arm to the braces as shown using the rubber-bands to lock into place.



You will need to put 2 rubber-bands onto the dowel before sliding in the sling arm

Slide the sling arm into place, threading the dowel through the hole that is at the 6 1/2" measurement. After sliding the sling arm into place, you will need to add 2 more rubber-bands.

Finally, place 2 additional rubber-bands on the outside of the supports to lock the dowel into place



Step 13



Attaching the counter weight bucket. Using the same method as with attaching the swing arm to the uprights, attach the bucket through the hole that was 1 1/2" from the end of the swing arm remembering where to place the rubber-bands to lock it into place.

Step 14

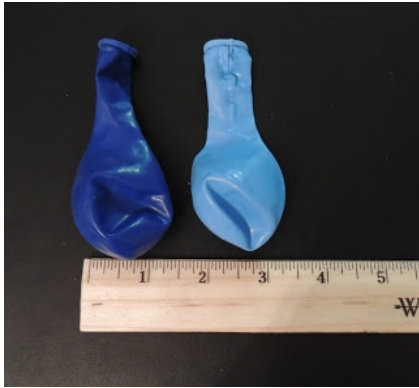


Take 2 - 16" lengths of 1 x 2 and a 2" by 16" piece of flat board and construct as seen.

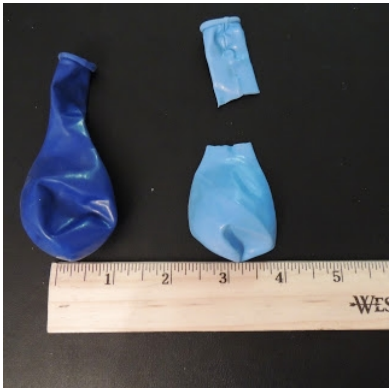


Assembly of the structure is now complete and you are ready to make and attach the sling.

How to Make Bean Bags



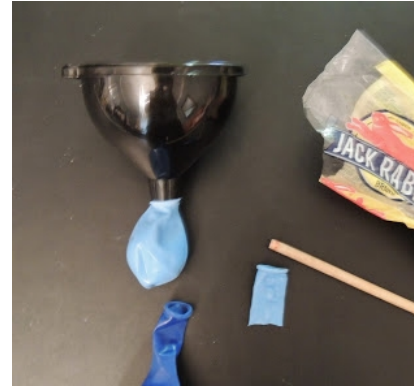
You will need 2 or 3 balloons about the size shown.



Cut the balloons as shown



You will also need the following materials: dried beans, lentils or other filling material. A funnel (wide opening is helpful) something to tamp the beans into the balloon. Here I used a chop stick.



Use the funnel to get the beans into the balloon



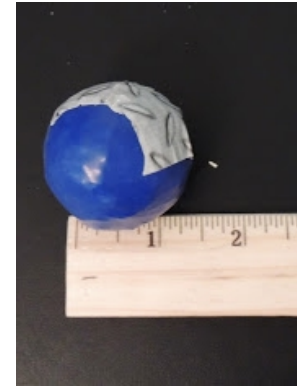
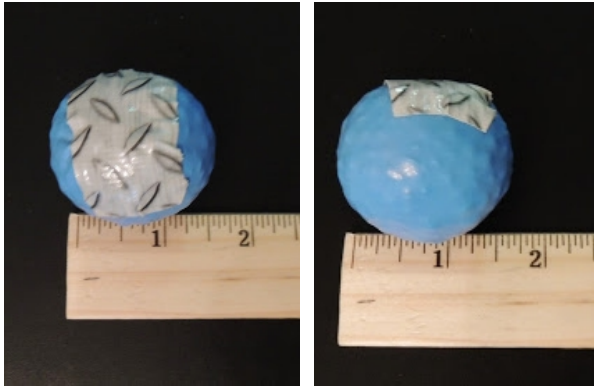
You will need to push the beans down into the balloon.

Be careful not to push so hard you put a hole in the balloon.

Try not to overfill as you will need enough room to twist and tape the opening closed.



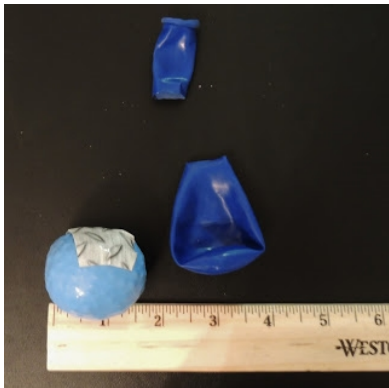
Once you reach the desired fill, twist the excess balloon at the top and tape the opening down



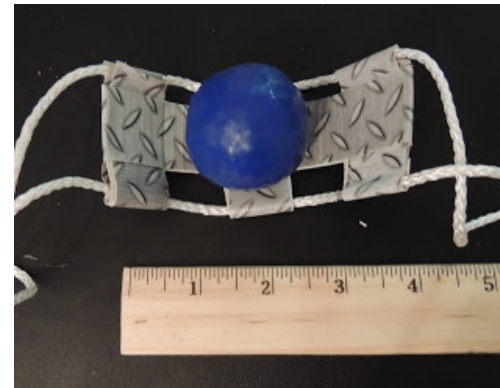
Tape down this opening as well - you do not need to twist this time, simply fold it over.

You can use a clear tape or a same colored tape for a better finish.

If you like, you can repeat this step again with a third balloon for better durability.

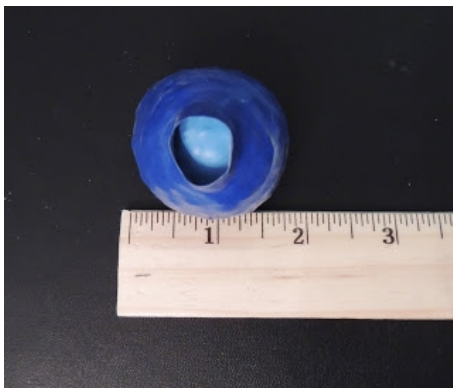


Now cut a second balloon



The ball should fit inside the sling as shown.

We recommend, that for the competition, you make several beanbags of various weights for firing at different distances.



Wrap the second balloon around the first balloon in the opposite direction so that the openings are on opposite sides.

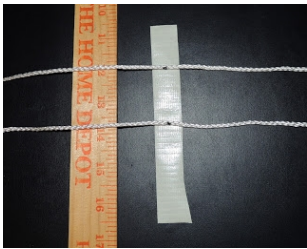
How to Make the Sling



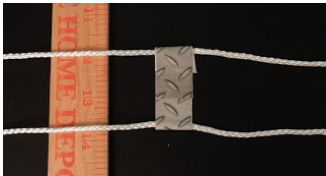
You will need approximately 84" of string total cut into two 42" pieces



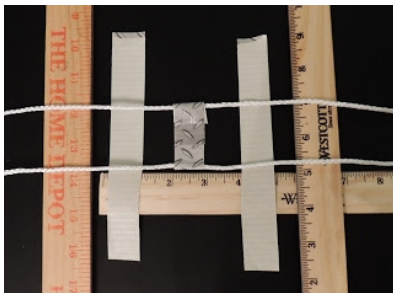
Mark the middle of each 42" piece (Ignore the 20" measurement shown - I want to create more room for error with a longer string).



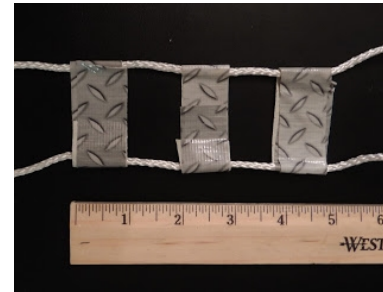
Cut a 5" length of duct tape and then cut it down the middle long ways. Place one piece of the tape (the half width of duct tape) at the midpoint of both strings keeping a $1\frac{3}{4}$ " distance between the strings as shown above.



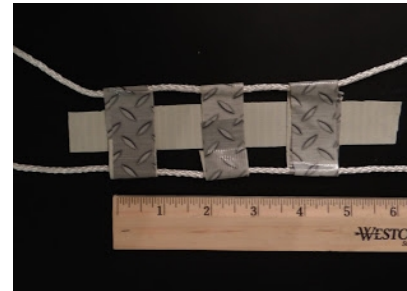
Fold the tape around the string as shown above making sure to maintain the $1\frac{3}{4}$ " distance.



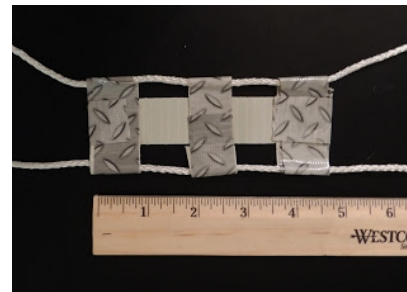
Place 2 more pieces (these also are the 1/2 widths of 5" lengths) 1" away from the center on each side keeping your $1\frac{3}{4}$ " string spacing throughout.



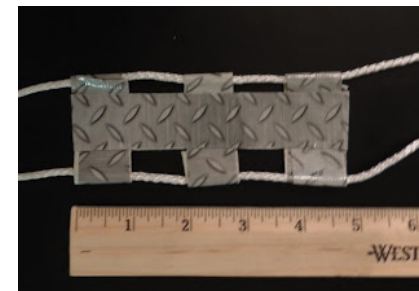
Fold the pieces as shown like you did with the first one.



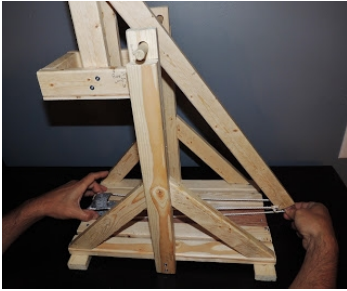
Cut another 7" length of duct tape and again, half it lengthwise. Place one of the strips lengthwise underneath the 3 pieces.



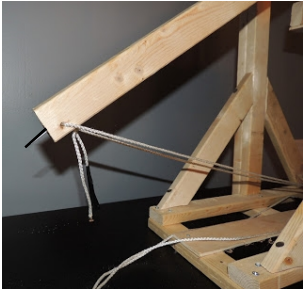
Fold the ends over to lock into place.



Repeat on the other side to finish the pocket as shown above.



Bring the main arm down to the base. Measure the distance it takes to extend the slings to the back of the base. Make sure the sting is tight at the furthest point.

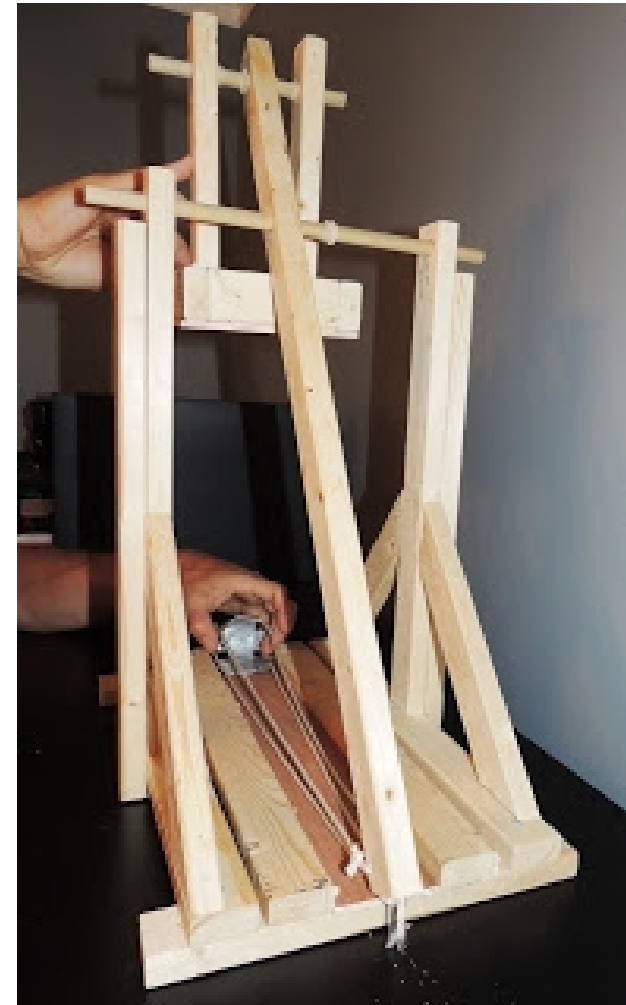


Tie one side of the finished sling through the hole on the main arm as shown.



Stretch the other end to the release pin (is a nail place in the end of the throwing arm located at the string end) at the top of the string arm and tie off.

Once both ends are secure and the pocket of the sling is centered, you can trim the excess string.



How to Make the Firing Pin

Making the firing pin is easy.



Cut a 3" piece of dowel and drill a hole in one end about an inch from the end. The hole will be for the string to thread thru so it needs to be small enough not to break the dowel but big enough to fit your string.



Next you will need some eye hooks. The size of the eye should be big enough to fit the dowel.



The eye hooks will attach to the trebuchet like this.



Now you will need to fashion the sling to take the pin. Start with about 5" of tape and split down the center leaving two strips. Trim about an inch off one side so it is shorter than the other.



Place the shorter side on the longer side with sticky sides facing each other leaving a sticky part at each end.



Now stick this strip loosely to the sling as shown. I used my dowel to keep the space.

You will need two more short strips - maybe 3-4".



This strip will wrap around the sling as shown. You can wrap twice for more security but I haven't had one break yet. Do the same below the loop. The pin fits like this.



When it's hooked up this is what you will have.

Fire in the hole!