**How To: Build a Trebuchet**

1. CHOSE YOUR WEAPON! - Deciding what type to build
   1. Fixed Counterweight (FCW)
   2. Offset Counterweight (OCW)
   3. Floating Axel Counterweight
2. UNDER CONSTRUCTION! - Designing the Treb
   1. Use these sites:
      1. TrebuchetFun.Weebly.com
   2. Use weather resistant materials
   3. Fasten the parts securely
      1. 5/16” bolts work well for the frame (6’ tall axel, 2 lbs projectile, 300 lbs counterweight, 8’ arm)
   4. Remember to design for disassembly – this will make it easier to transport
3. THE BUILD - Building the Treb
   1. Grab a friend, it’s going to take 4 hands
   2. Build the side supports at the same time so they both have the same dimensions
   3. Build a sturdy box
   4. Parts List
      1. Structure
         1. Solid Base
         2. Lumber for the side supports
         3. Bearings
         4. Shaft (for safety, use steel only)
         5. Arm
         6. Hardware (bolts, nuts, washers)
      2. Mechanics
         1. Trigger
         2. Hook (release mechanism)
         3. Rope
         4. Pouch
4. TRIAL AND ERROR! - Test the Treb
   1. Watch for it to fire backwards on the first launch!
      1. To prevent this, set your hook 45 degrees forward and work from there
   2. Decide on a consistent projectile weight
      1. I made an indestructible bean bag weighing 2 lbs
         1. I used a lot of duck tape
         2. I used a food scale to weight it exactly
      2. Remember that the projectile weight, size, and shape GREATLY affect the performance of the launch. Find the exact (I mean exact) projectile that will be used in the contest and use that for testing.
   3. Note the wind direction
   4. Set up yardage markers – so you can track distance verses your adjustments
      1. For example, 1 pound of more weight yields 1 yard farther
   5. Change one variable at a time – It will be tempting to change more!
      1. Changing more than 1 at a time will cloud the results
      2. Trebuchets can be very sensitive so limit the changes
      3. Every so often, don’t change any variable and see how accurate the treb is
         1. This will also uncover any variability in the set up
            1. For example, if the trigger is set up differently, the treb performance could change.
5. LET IT LAUNCH! - Competition/ Performance/ Fun
   1. Under construction
6. Clif Notes!
   1. Under construction