

Congratulations on your very own Backyard Catapult® assembly kit from RY-KEA manufactured goods! These instructions are guaranteed to be easy to follow or our name isn't RY-KEA. Do you have a screw loose or is your kit missing one? Either way, there is a remedy and we are here to help. Just contact the President and CEO of RY-KEA, Ryan. The inbox for complaints is currently full, but if you just want to say "hi" and send pictures of your catapults, that box is always available. All joking aside, safety is no joke. Please be cautious.

You have a received bunch of wood pieces and screws and stuff that came in plastic bags or were bundled together. Please go over your inventory checklist to see that you have all the parts you need.



Excellent, I knew you wouldn't be missing anything. Now, how much do you really like to follow instructions? It's okay if you want to treat this project like a puzzle and then go back to the instructions to get hints and clues. For starters, the base frame of your catapult has been preassembled. You will build off of this.



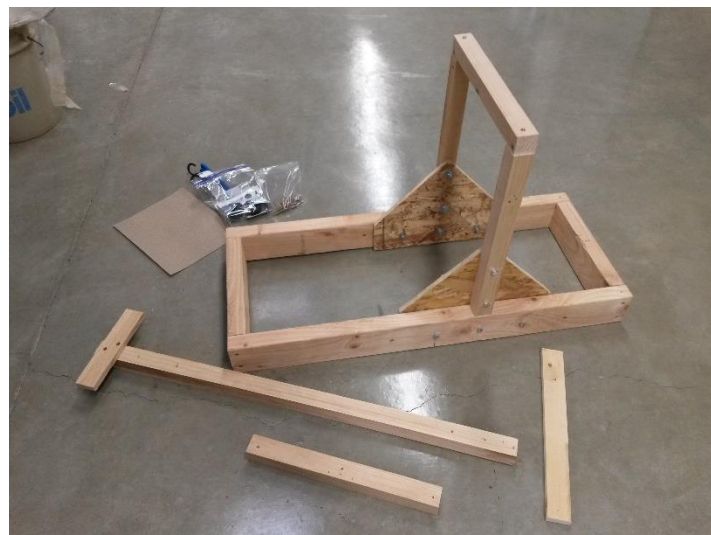
How about tools? Having the right tools handy makes the job go easier. Using a ½” wrench and a crescent wrench is a good way to tighten the bolts (see picture below). Maybe you have a socket wrench set available. Two sets of pliers will work too, just need to be able to grip the head of the bolt while you turn the nut tightly. The washers have a purpose. Place between the wood and the bolt head or nut before you tighten. This increases the surface area for the force you are applying to squeeze the wood together good and tight. Did I mention to screw the nut onto the bolt good and tight? Good.

If you have a power drill to screw pieces together, great. But if you don't, you should be able to manage with just a phillips head screwdriver because the pieces have been pre-drilled. It may take someone strong to make the final turns of the screw and to snug the pieces together nice and tight, but it can also be an opportunity to learn about torque. By grabbing the screwdriver with pliers and turning, the torque on the screw will be increased. You should be able to complete assembly with this minimal list of tools.



Find the two braces in your kit. They look like houses. These have five holes drilled large enough for your bolts to pass through. Make sure your base is placed with the “bottom” arrow pointing down. You will see that the base has five holes drilled in a row on each side. You have three positions which to mount your braces: forward, middle and back. You can also decide whether to put the braces on the inside of the frame or on the outside, it's up to you; choose a position and experiment later. Feed the bolts through making sure washers are on both sides and tighten your braces to the base frame.

Next, mount the two vertical arm pieces to the braces. These are the pieces that came bundled with the braces and have two bolt size holes drilled in them. After the vertical arms are mounted, find the lateral arm for the catapult tower. This is the 15” 2x2 that only has two holes pre-drilled at the ends. Tighten down using the long, 2.5” screws.



You will find that you have three pieces of wood left. The catapult arm is 36" long. One piece is a thinner piece of wood with two holes drilled on both ends and can be attached using 1.25" screws. This piece is not necessary but can be used as you like to strengthen your tower or to change the angle which the catapult arm stops its motion. The third piece is your catapult hinge adjustment piece. You can attach the hinge for the catapult directly to the base, or higher by installing this piece to the front of the base using three 2.5" screws. .



Line up your holes and screw the hinge into place on the arm and on the base or height adjustment piece. Use the smallest size screws in your bag. Your catapult is almost ready to launch. What you need now is some energy by which to create enough force to launch an object. You have been given a set of bungee cords and material. These will give you options as to how much force you want to use. The amount of force the bungee creates is also related to how far it is stretched from its relaxed position. On the base and along the catapult arm, you will find holes pre-drilled for the "eye" screws. Once screwed in tightly, they will allow you to hook your bungees into place. Save the third eye screw for the back of the catapult arm up at the top. This will catch the pin that will hold your catapult arm in loaded position and act as a trigger when ready to fire away. The piece of twine can be tied to pin.



When completed, your catapult should look something like this, but only better. See that yogurt cup thing at the end? You need something like that to hold the object you are going to launch, be that a tennis ball, baby pumpkin or a water balloon (you didn't hear that last one from me). It is up to your teams to find/devise and attach your own cup. And it is also up to your teams to paint/stain/decorate your catapult. If you can devise more force using other springs, do it! Make it your own, own it! But make sure to attach the safety and caution stickers where they belong: up where the catapult arm strikes the tower and down by the loaded position. As always, safety first. Then you can focus on having fun while learning a bit about physics and making things fly. You have the ability to change the launch angle and to adjust the force of your spring. I almost forgot to mention the wheels. Holes are drilled for the wheels, screw them into place and make your cat mobile! MEOW!! See how far you can launch a tennis ball. How far does an object that is twice the weight of tennis ball fly?



If, for some reason, you are missing parts, if a bolt doesn't fit right, if you don't have the right tools available to fix the problem, please don't hesitate to contact Ryan at [rdpuckett@ucanr.edu](mailto:rdpuckett@ucanr.edu). Customer service is our #1 priority here at RY-KEA manufactured goods.

Lastly, an additional reminder about safety. Please be safe. Use safety goggles if available. Keep small children and pets away from the loaded catapult. Please do not launch small animals with the catapult. That is wrong. Do not aim catapult at friends or foes. Do not launch objects into your neighbor's yard or at their window. Stay out of trouble. That is my advice.

Here are a few additional tips:

Find a way to weigh down the catapult, either at the front end or the back end, or both. You will need weight at the back end when you pull the cord for the trigger. Bungee cords get tired the more you use them. They will lose their spring and won't launch as far. The more powerful your spring, the further you can launch, but the harder it will be to lower the arm into loaded position. Use caution. Use the handle to pull or press arm down, while another person puts the pin in place. Seek the optimum launch angle by adjusting the position of the brace and changing where the arm strikes the cross bar.

Feel free, if so inclined, to improvise construction of the catapult. If you can make this 3' catapult throw further than the current design, then go for it. Just let your imagination do its thing. Be creative, do a little homework, be experimental, and be wonderful you ☺