I'm not a robot

Syringes (2)PVC pipes (various sizes)HoseClampsPlywood or cardboardScissorsDrillScrewsZip tiesHot glue gun Start by constructing the base of the hydraulic arm. Cut a piece of plywood or cardboard into a square or rectangular shape, depending on the size you desire. Use a drill to create holes where the PVC pipes will be mounted.Step 2: Assembling the ArmTake two PVC pipes of different lengths and attach them at a 90-degree angle using a PVC connector. This will serve as the main arm structure. Attach additional PVC pipes as desired to create a multi-jointed arm.Step 3: Creating the GripperUsing additional PVC pipes and connectors, construct a simple gripper at the end of the arm. This will allow your hydraulic arm to grab and hold objects. Ensure the gripper is secure and functional.Step 4: Installing the Hydraulic SystemNow its time to build the hydraulic system. Connect one syringe to the gripper using a hose, clamps, and zip ties. Attach the other syringe to the base. Make sure the syringes are securely fastened and airtight.Step 5: Testing the Hydraulic ArmFill one syringe with water or a fluid of your choice. Push the plunger to observe how the hydraulic arm moves. When one syringe is compressed, the other will extend, allowing the arm to bend and move. Test the strength and precision of your hydraulic arm by lifting various objects.Step 6: Improving and CustomizingExperiment with different designs and materials to enhance your hydraulic arm. You can paint it, add additional features, or even connect it to a control system for more advanced functionality. The possibilities are endless!Congratulations! You have successfully built your own hydraulic arm. By following this step-by-step guide, you should now have a fully functional hydraulic arm that can be used for educational purposes or simply as a cool project. Have fun exploring the world of hydraulics and continue to learn and improve upon your creation!If you have any questions or want to share your experience building a hydraulic arm, feel free to leave a comment below. Happy building!Quanto stato utile questo articolo?0Vota per primo questo articolo! Hello Instructables!In this Instructables we will be showing you how to make your very own Hydraulic Arm! This project focuses on the principles of hydraulic movements. To do that we made a small scale demonstration of a Robotic Hydraulic Arm. We managed to do some pretty cool tasks with our ''Arm'', do check out the video down below for a better understanding!This project is entirely made with cardboard and a couple of syringes, all the plans and blueprints are available. What are you waiting for? Let's get making!We post all of our projects onInstructables, a place that lets you explore, document, and share your DIY creations. You can also subscribe to ourYouTube Channel Here We post lots of in progress photos and have lots of conversation on ourFacebook Page and Instagram.Please support us on Patreon and also get a preview of what we are up to. Please make sure to follow, share and drop a comment to let us know how you liked it!One of the reasons that this project is fun to make, is because the materials needed are very cheap and can be easily found at home!MATERIALS:CARDBOARD (preferably a double corrugated board although you could manage with a single corrugation. Will result to a slightly weaker model.) 10 ml SYRINGES x 8 (these syringes will act like the muscles of the hydraulic arm) 2m long TUBE (the tube needs to fit snugly into the opening of the syringe.) TOOTHPICKS SUPERGLUE (you will need a lot!)TOOLS:X- acto knife A pair of scissorsLet's get making...The whole design fits on to two A4 size sheets. We first sketched the parts and then keeping in mind the mechanisms made the blueprint.I have made this step much easier for you guys, all you need to do is to print out the templates in the next step. If you wish you can tweak the design as per your looks :)We designed all the parts so that you don't have to measure and draw. Simply print out the two files, with the same scale, all parts are in their right dimensions. Stick the printouts onto the cardboard and get making!The toothpick holes are there too, if you have any other doubts we have uploaded lots of pictures so that you have a better visual understanding! Happy Making!HYDRAULIC ARM PARTS (template 1).pdfBIG BASE (template 2).pdfThen you need the arm.Therefore you have to cut the base, the lower arm, the upper arm and the hook. For the base you need two pieces about 6 long, 3 wide at the bottom and 1 at the top. In addition, you need a single piece of 3 by 3for the bottom to glue the other on top, but for now just let the glue setin the corner and cut the other parts.The lower arm is even easier to do, just get two pieces of about 8 in length, 1 wide and youre ready. The upper arm is very similar, but a bit longer. Going for 10 will be fine.After this you need the hook, but to explain this, words are not very suited. Instead pause the video at 3:02 and copy his sketch.Youll need more parts for the hook: a triangular piece of about 3 by 3, two paper clipsand the claws itself. Once again please refer to the video (3:30 to 3:40).You will also need five pairs of popsicle sticks with two or three layers of cardboard in between in the middle bit. One to turn the arm and four for the remote control.Once again we will refer to the video above, but hey, nobody said its gonna be quickor easy Before you switch back to the video, here are some tips.Start with the upper arm, because this is the narrowest part, yet the syringes have to fit between both sides. From there on, work your way down to the bottom and add the hook last. When you ruin something on the way, you dont need to rebuild that bitFollow the templates and carefully cut out both the Arm Support and Forearm. Note that I had started it out with a single corrugated cardboard but then I had to strengthen it by adding a second layer.Start by making a rough cut and then repeatedly cut deeper and deeper until the piece pops right out, don't force!Once you have cut out the gripper you can proceed to making the holes.All the points on the templates are where the holes should be. These holes are the size of your toothpicks so find the appropriate bit. Start by poking the tip of your knife to form a small dent, a guide for the bit. Then carefully drill out all the holes and you are ready to start assembling the ARM.TIP : You will notice that just by the weight of the drill the hole gets poked. though the small spacers tend to fold and get ruined. To avoid that from happening you can push through a screwdriver instead. I would advise you to start by assembling a dry fit to make sure you know which piece goes where. This will avoid any mistakes or confusions later on. The plans are well explained and I don't think you will have any problems in following them :)This pictures will give you a visual idea however You will notice that the ends of the pieces with extensive use weakens and starts separating. We found an easy way to fix that by covering all the edges of the pieces with strips of masking tape! This not only strengthens the whole structure significantly but also adds a nice look to our model!Hopefully you havent glued all the parts together yet, only the separate pieces themselves Because now comes the part you may need a third hand. Fixing the parts together making a working hydraulic arm needs a bit patience and a lot of toothpicks. Also getthe cold glue bottle ready!Every joint of the hydraulic arm is a toothpick, fixed with two little bits of cardboard glue to its ends. Be careful when you put theparts of the arm together and dont break anything. Otherwise you have to redo that part.In the process of joining all the parts together, please dont forget the syringes. (You may watch the video again and again until you get it right, Ive done the same) When everything is in place you just need to add the hydraulic fluid. In real excavators this would be top grade hydraulic oil, but we will use water instead. If you like you can prepare four different jars with water and add some food coloring as in the video.Then carefully fill up the four unused syringes and connect them with the others with the pipes like he did in the video. When this is done you can make a first test.To make things a little more comfortable, you may build a remote control. Yet again you need twobig pieces of cardboard as base and zip ties to fix the syringes. Using the four leftover pairs of popsicle sticks you can build levers as the guy in the video. Once again we will refer to the video above, but hey, nobody said its gonna be quickor easy Before you switch back to the video, here are some tips.Start with the upper arm, because this is the narrowest part, yet the syringes have to fit between both sides. From there on, work your way down to the bottom and add the hook last. When you ruin something on the way, you dont need to rebuild that bit Take four syringes, these will be the ones attached to the Arm. To attach it in a way that the joint can still pivot you need to adjust the syringes like so. Clip the extra plastic piece on top as it can cause unnecessary widthDrill a hole around half a cm from the top of dia the size of the toothpick. One out of the four syringes will have two holes at the top, this being the gripper's syringe.Get two zip ties and close them in this ''figure of eight'' shape. Tighten one loop around the syringe then slip in a toothpick on the other one and tighten it till it bits tightly, finally clip the extra bit of the zip tie.The pictures will remove any doubts!To make the rotating platform, find an old pen cap, you will use that as the axis on which the arm rotates on. Cut a piece of cardboard with length and width little bigger than the Support pieces.Make a hole in the center with dia a bit bigger than the pen cap's, to permit easy movement. Stick the piece with superglue to the support pieces. Then grab a much bigger rectangular cardboard piece to form your base. Like before drill a hole in the center this time so that the cap fits snugly. Push the cap in and put dabs of glue for strength. Then slip in the main body... Once again we will refer to the video above, but hey, nobody said its gonna be quickor easy Before you switch back to the video, here are some tips.Start with the upper arm, because this is the narrowest part, yet the syringes have to fit between both sides. From there on, work your way down to the bottom and add the hook last. When you ruin something on the way, you dont need to rebuild that bit Now that we have the mechanism ready it's time to add the syringe. Cut the pieces and stick them together like in the pictures. Then attach one end of the syringe to the newly made piece. Stick the piece with superglue onto the main body, all that's left is to compress the syringe and simply insert a toothpick into the base. this will automatically fix your syringe and convert the movement into a rotation of the arm. Insert the semi stiff copper wires in the inner holes and bend them outwards so that they cant come out. Then twist each one into their respective holes in the syringe. I bent two small pieces of cardboard around a ruler to give me my end of the gripper. To add grip we cut out two tiny rectangles from an old ''Yoga Mat'' and stuck them at both ends. Fix the syringe and stick the triangular part of the gripper to the arm.You are almost done, just clip the ends of the protruding toothpicks.Once again we will refer to the video above, but hey, nobody said its gonna be quickor easy Before you switch back to the video, here are some tips.Start with the upper arm, because this is the narrowest part, yet the syringes have to fit between both sides. From there on, work your way down to the bottom and add the hook last. When you ruin something on the way, you dont need to rebuild that bit The lower arm is even easier to do, just get two pieces of about 8 in length, 1 wide and youre ready. The upper arm is very similar, but a bit longer. Going for 10 will be fine.After this you need the hook, but to explain this, words are not very suited. Instead pause the video at 3:02 and copy his sketch.Youll need more parts for the hook: a triangular piece of about 3 by 3, two paper clipsand the claws itself. Once again please refer to the video (3:30 to 3:40).You will also need five pairs of popsicle sticks with two or three layers of cardboard in between in the middle bit. One to turn the arm and four for the remote control. Either youjust finished your own robotic arm,well done by the way. Or youve read till here without the intention to build one yourself but then we wont mind, well done to you anyways! Either youjust finished your own robotic arm,well done by the way. Or youve read till here without the intention to build one yourself but then we wont mind, well done to you anyways! Mix 4 colours with water each in a glass, and fill the 4 ''controllers'' (remaining syringes). Then cut your tubing into four equal parts. Attach the end to the controller and squeeze the syringe till water starts coming out at the other end. This is to make sure you don't loose any pressure. now attach the other syringe (the one in the arm) making sure it's fully compressed.Press and pull to see the magic! Each group needs: plastic syringes, such as from McMaster-Carr for ~$1.27 per syringe; see note belowplastic tubing, such as from hardware and pet supply stores for ~$20; see note belowvarious wood scrapsbolts, screws, nuts, washersother APPROVED materials1 empty soda canNote about syringes and tubing: In this activity, all the syringes must be exactly the same and it is important that the plastic tubing fits snugly on the tip of the syringe. A good option is a 50 or 60 cc plastic manual syringe with a tapered tip, such one available from McMaster-Carrthe "60 cc plastic manual syringe with taper tip" for $1.27 per syringe. It may be helpful to purchase the syringes first and then bring one to a hardware or pet supply store to find appropriate sized plastic tubing. To share with the entire class:tape20 x 20 cm piece of wood or cardboard to serve as a walldrill (for teacher use or with appropriate supervision)saw (for teacher use)empty soda can Have you ever seen a car lifted into the air at an auto repair place? Have you ever wondered how an elevator can lift a load of people up into the air? Well, after our project today, you'll have a better understanding of how these work, because we're going to look at hydraulic systems. Hydraulic systems use a liquid, usually oil, to transmit force. This system works on the same principles as other mechanical systems and trades force for distance. Hydraulic systems are used on construction sites and in elevators. They help users perform tasks that they would not have the strength to do without the help of hydraulic machinery. They are able to perform tasks that involve large amounts of weight with seemingly little effort. hydraulics: Involving or moved by fluid under pressure. pneumatics: Involving the mechanical properties of air and other gases. Safety Factor(N): A number used to describe how much more force your device should withstand past the max expected force based on a number of parameters such as material and dimensions (N=1 means only can withstand 100% of expected force, so it will fail at 101% of expected load). prototype: A working model of a new product or new version of a product. This activity is comprised of two parts: Part 1 - Investigating Pneumatics and Hydraulic Systems Handout: 1 - 2 class periods at 40 minutes each.Part 2 Creating the hydraulic arm: three 40-minute classes (This activity can be done in fewer class periods, but giving students this amount of time enables them to test numerous design ideas and further understand the engineering design process and the underlying concepts.) Hydraulic systems are used in many different types of machines: control surfaces on airplanes, elevators, automobile lifts, and backhoes. The idea behind a hydraulic system is that force is applied to one point and is transmitted to a second point using an incompressible fluid. You can find detailed background information oon how hydraulic machines work at . Build a soda can test area that is 20 x 45 centimeters. Use tape to mark the perimeter of the test area. Place a 20 x 20 cm tall wall in the middle of the test area so the area is divided into two equal areas, each measuring 20 x 22 cm. Draw a circle on each side of the wall. Write "Start" in one and "Finish" in the other. The circles should be ~4 centimeters from the wall and 6 centimeters from the sides. These dimensions are flexible. Smaller would be easier and larger dimensions are harder.Schematic diagram of the hydraulic arm challenge. Playing field for the hydraulic arm challenge. Make copies of the journals and handouts.Gather materials. Divide the class into groups of two students each. Have each design team: Research the engineering design process and answer the questions on the Investigating Pneumatics and Hydraulics Systems Student Handout.Research possible solutions to the challenge. Tips: Look for pictures of other mechanical arms (or parts of arms) that perform functions similar to the ones that they must perform. Think about the connection between their team's component and the components it is connect to. The connections are the most challenging part!Develop a portfolio (a collection) of sketches that attempt to solve the problem. Share with the entire design team. Upon identifying a promising design, brainstorm with the next design team about attaching them together. Critique (be nice, constructive) the designs and make a short list of pros (+) and cons (-) for each idea. Identify the best ideas and vote to decide upon them.Make final engineering sketches of the parts that are needed.Construct the prototypes, noting changes, modifications, failures and successes. It is perfectly fine to mark up your engineering sketches. Show your work!Test the prototype. TRY TO MAKE IT FAIL. What do you have to do to get it to fail? Can you redesign it to prevent that from happening? Make your design the best it can be. (Students like to make their designs fail. They understand that as an instruction and see it as a good mindset for testing prototypes.)Write down information on how long it took for your device to fail.Redesign and reconstruct.Retest.Once satisfied, plot your found data to see how your device improved as you modified it.Present the portfolio of marked-up drawings, the finished arm, and demonstrate the arm to the class. Design Check List (pdf) [Share this outline of the process that students should be following] Hydraulic Arm Rubric (pdf)Investigating Pneumatics and Hydraulic Systems Student Handout (pdf)Hydraulic Arm Design Journal (pdf) Cut and drill the wood if students do not have experience. See Researching the Engineering Design Process Handout Activity Embedded Assessment: Administer the Arm Investigating Questions and Design Check List. Post-Activity Assessment: Evaluate the student project using the attached Hydraulic Arm Rubric, with criteria on research, imagining-planning-improving, creativity, written or oral sharing, and how the mechanism meets the challenge. Additional Multimedia Support Watch a 2:27-minute video of three teen girls operating the hydraulic arms they designed to pick up and move marshmallows; see thinkdesign!'s Hydraulic Robot Arm Challenge at YouTube: And it's done! Now go ahead and test your new Hydraulic Arm. Go pick up a can and try to place on a given target. Show it off with your friends! The simple Hydraulic System is what makes this project really stand out and the fact that it's so easy to build. Hope you enjoyed this instructables, see you next time! 0 ratings0% found this document useful (0 votes)65 views6 pagesThis document provides a step-by-step guide to creating a cardboard robotic hydraulic arm using inexpensive materials like cardboard and syringes. It includes detailed instructions, blueprinAI-enhanced title and descriptionSaveSave CARDBOARD Robotic Hydraulic Arm _ 16 Steps (with P... For Later0%0% found this document useful, undefined0 ratings0% found this document useful (0 votes)65 views6 pagesThis document provides a step-by-step guide to creating a cardboard robotic hydraulic arm using inexpensive materials like cardboard and syringes. It includes detailed instructions, blueprints, and tips for assembly, emphasizing the principles of hydraulic movement. The project is designed to be accessible and fun, allowing users to demonstrate the functionality of their hydraulic arm once completed.0 ratings0% found this document useful (0 votes)65 views6 pagesThis document provides a step-by-step guide to creating a cardboard robotic hydraulic arm using inexpensive materials like cardboard and syringes. It includes detailed instructions, blueprinAI-enhanced title and description Learn how to make hydraulic Arm from cardboard at home with use of injection and cardboard. This working model is very helpful to understand how hydraulic arm is work, here injection is used as hydraulic arm and water as oil. This project is designing a hydraulic arm model based on the principle of hydraulic systems. In this project hydraulic arm model is hydraulically operated and controlled by the movement filled with some fluid. It consists of various parts connected to each other in a pre-designed manner which are guided in a constrained way to obtain required output. The principle of the working of the hydraulic arm is PASCALs LAW. This law states that when a pressure is applied at one point of a fluid contained in a constrained volume, then the pressure due to that force is equally transmitted to all the points of the fluid, which are acted upon by the same pressure. Using the same principle, we applied pressure to fluid in syringe which is transmitted to other end of tube which is connected to a syringe. The operation of the hydraulic arm is controlled by the pressure of the fluid. Hence, this project is useful from both the perspectives that are theoretical as well as practical. 0 ratings0% found this document useful (0 votes)2K views15 pagesThis document provides instructions to build a cardboard robotic hydraulic arm using cardboard and syringes. The arm can perform tasks like picking up objects using the hydraulic principle. SaveSave CARDBOARD Robotic Hydraulic Arm For Later0%0% found this document useful, undefined0 ratings0% found this document useful (0 votes)2K views15 pagesThis document provides instructions to build a cardboard robotic hydraulic arm using cardboard and syringes. The arm can perform tasks like picking up objects using the hydraulic principle. All materials are inexpensive and readily available. Templates and plans are provided to make cutting the cardboard pieces simple. The syringes act as hydraulic "muscles" that allow the arm to move when squeezed. Testing involves using colored water in syringes to operate the arm and pick up objects, demonstrating the successful use of hydraulics.0 ratings0% found this document useful (0 votes)2K views15 pagesThis document provides instructions to build a cardboard robotic hydraulic arm using cardboard and syringes. The arm can perform tasks like picking up objects using the hydraulic principle. For my project, I designed and built a hydraulic arm using cardboard. I chose cardboard because of its accessibility, versatility, and environmental benefits. The aim was to demonstrate that complex mechanical concepts, such as hydraulics, can be effectively illustrated using simple and sustainable materials. This project not only showcases the engineering applications but highlights the potential of cardboard on how creativity and ingenuity can transform this material into functional and impressive structures.CARDBOARD10 ML SYRINGE WITHOUT NEEDLEOXYGEN AIR PUMP TUBEFLEX KWIK(SUPER GLUE)TOOTHPICK STICKSUSED DRY CELLTWO COPPER WIRES(15CM EACH)TWO ICE CREAM STICKSSAND PAPERThe first two pictures are equivalently same and depicts the measurements of the supporting structure.The third picture depicts the measurement of the handle structure.Cut the parts in cardboard using the measurements as shown.Take a cardboard of considerable size, and fix the used dry cell in the center of the cardboard. This used dry cell serves as the axis for moving the hydraulic structure as a whole. Now, make a hole equal to the size of the battery in both the square parts which we had already made.Now paste it using glue gun as shown.Next, take the triangular parts which we had made and glue it with the bottom as shown.From the made parts take the two small rectangular parts.Make stoppers (small square cardboard used to prevent the structure from slipping) and use it as shown.Now attach the rectangular part, stopper with the bottom part using a tooth pick as shown.Take the longest rectangular part from the made parts.Using stoppers and toothpick, stick the longest part with the middle section as shown.Join the handle parts as shown.This step will be quite difficult.Make holes as shown.The upper hole will be used to attach with the handle using tooth picks.The lower hole will be used for inserting copper wire which in turn will be used for connecting to the syringe.At the end of the hooks, stick sand paper because it provides some grip for picking up objects.Now glue the handle part with the top section.Make a knot using tag for three syringes as shown.At the top of the piston make holes for four syringes including the three that we already modified.Now support the syringes with the respective sections using toothpicks by inserting toothpicks into the tag and the hole made in the piston.Remember that we have used a battery. What was it for? Well the battery is used for turning the structure as a whole. How can we do it?Take the two ice cream sticks and place some card board as shown. Insert a syringe between the sticks. Using hydraulics, now we can turn the systemWe have done this project. Now sit and enjoy it's mechanism.....Hello Instructables!In this Instructables we will be showing you how to make your very own Hydraulic Arm! This project focuses on the principles of hydraulic movements. To do that we made a small scale demonstration of a Robotic Hydraulic Arm. We managed to do some pretty cool tasks with our ''Arm'', do check out the video down below for a better understanding!This project is entirely made with cardboard and a couple of syringes, all the plans and blueprints are available. What are you waiting for? Let's get making!We post all of our projects onInstructables, a place that lets you explore, document, and share your DIY creations. You can also subscribe to ourYouTube Channel Here We post lots of in progress photos and have lots of conversation on ourFacebook Page and Instagram.Please support us on Patreon and also get a preview of what we are up to. Please make sure to follow, share and drop a comment to let us know how you liked it!One of the reasons that this project is fun to make, is because the materials needed are very cheap and can be easily found at home!MATERIALS:CARDBOARD (preferably a double corrugated board although you could manage with a single corrugation. Will result to a slightly weaker model.) 10 ml SYRINGES x 8 (these syringes will act like the muscles of the hydraulic arm) 2m long TUBE (the tube needs to fit snugly into the opening of the syringe.) TOOTHPICKS SUPERGLUE (you will need a lot!)TOOLS:X- acto knife A pair of scissorsLet's get making...The whole design fits on to two A4 size sheets. We first sketched the parts and then keeping in mind the mechanisms made the blueprint.I have made this step much easier for you guys, all you need to do is to print out the templates in the next step. If you wish you can tweak the design as per your looks :)We designed all the parts so that you don't have to measure and draw. Simply print out the two files, with the same scale, all parts are in their right dimensions. Stick the printouts onto the cardboard and get making!The toothpick holes are there too, if you have any other doubts we have uploaded lots of pictures so that you have a better visual understanding! Happy Making!Follow the templates and carefully cut out both the Arm Support and Forearm. Note that I had started it out with a single corrugated cardboard but then I had to strengthen it by adding a second layer.Start by making a rough cut and then repeatedly cut deeper and deeper until the piece pops right out, don't force!Once you have cut out the gripper you can proceed to making the holes.All the points on the templates are where the holes should be. These holes are the size of your toothpicks so find the appropriate bit. Start by poking the tip of your knife to form a small dent, a guide for the bit. Then carefully drill out all the holes and you are ready to start assembling the ARM.TIP : You will notice that just by the weight of the drill the hole gets poked. though the small spacers tend to fold and get ruined. To avoid that from happening you can push through a screwdriver instead. I would advise you to start by assembling a dry fit to make sure you know which piece goes where. This will avoid any mistakes or confusions later on. The plans are well explained and I don't think you will have any problems in following them :)This pictures will give you a visual idea however You will notice that the ends of the pieces with extensive use weakens and starts separating. We found an easy way to fix that by covering all the edges of the pieces with strips of masking tape! This not only strengthens the whole structure significantly but also adds a nice look to our model!Take four syringes, these will be the ones attached to the Arm. To attach it in a way that the joint can still pivot you need to adjust the syringes like so. Clip the extra plastic piece on top as it can cause unnecessary widthDrill a hole around half a cm from the top of dia the size of the toothpick. One out of the four syringes will have two holes at the top, this being the gripper's syringe.Get two zip ties and close them in this ''figure of eight'' shape. Tighten one loop around the syringe then slip in a toothpick on the other one and tighten it till it bits tightly, finally clip the extra bit of the zip tie.The pictures will remove any doubts!To make the rotating platform, find an old pen cap, you will use that as the axis on which the arm rotates on. Cut a piece of cardboard with length and width little bigger than the Support pieces.Make a hole in the center with dia a bit bigger than the pen cap's, to permit easy movement. Stick the piece with superglue to the support pieces. Then grab a much bigger rectangular cardboard piece to form your base. Like before drill a hole in the center this time so that the cap fits snugly. Push the cap in and put dabs of glue for strength. Then slip in the main body... Now that we have the mechanism ready it's time to add the syringe. Cut the pieces and stick them together like in the pictures. Then attach one end of the syringe to the newly made piece. Stick the piece with superglue onto the main body, all that's left is to compress the syringe and simply insert a toothpick into the base. this will automatically fix your syringe and convert the movement into a rotation of the arm.Insert the semi stiff copper wires in the inner holes and bend them outwards so that they cant come out. Then twist each one into their respective holes in the syringe. I bent two small pieces of cardboard around a ruler to give me my end of the gripper. To add grip we cut out two tiny rectangles from an old ''Yoga Mat'' and stuck them at both ends. Fix the syringe and stick the triangular part of the gripper to the arm.You are almost done, just clip the ends of the protruding toothpicks.Mix 4 colours with water each in a glass, and fill the 4 ''controllers'' (remaining syringes). Then cut your tubing into four equal parts. Attach the end to the controller and squeeze the syringe till water starts coming out at the other end. This is to make sure you don't loose any pressure. now attach the other syringe (the one in the arm) making sure it's fully compressed. Press and pull to see the magic!And it's done! Now go ahead and test your new Hydraulic Arm. Go pick up a can and try to place on a given target. Show it off with your friends! The simple Hydraulic System is what makes this project really stand out and the fact that it's so easy to build. Hope you enjoyed this instructables, see you next time!

Making hydraulic arm. Cardboard hydraulic arm. How to make a cardboard arm. How to make hydraulic powered arm from cardboard. How to make a hydraulic arm with cardboard measurements.