

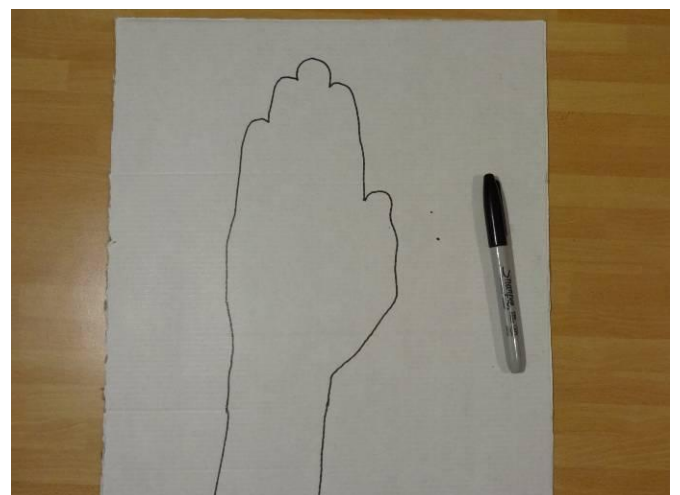
How to make a mechanical robot hand

You will need:

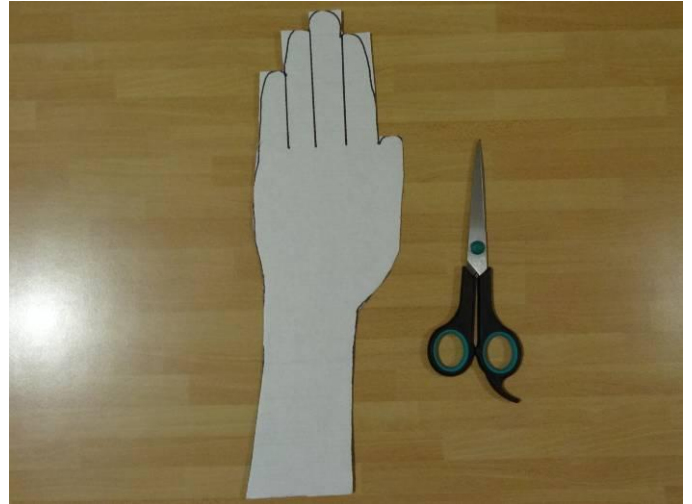
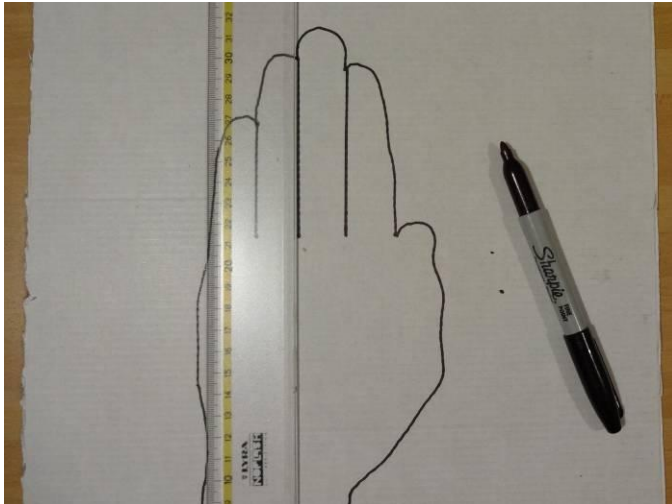
- Thick cardboard (large enough to draw around your hand and wrist)
- Narrow rubber bands
- Drinking straws
- Sticky tape
- Scissors
- Nylon cord or string
- Ruler
- Pen



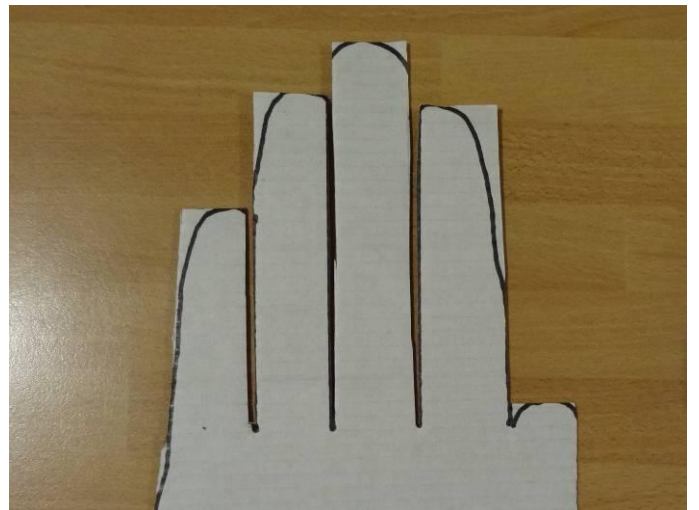
1. Draw around your hand with your fingers closed.



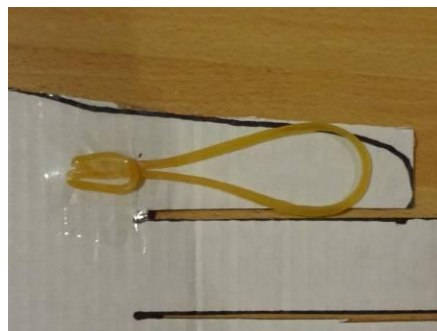
2. Draw lines with the pen and ruler to divide the fingers. Then cut around the outside of the hand shape. You do not need to cut perfectly around the top of the fingers.



3. Cut the lines to separate the fingers. (Ignore the thumb; our robot will only have moveable fingers.) Make two cuts between each finger so that the gap is wider and the robot's fingers can move more easily.



4. Use sticky tape to attach a rubber band to the bottom of the first finger leaving a small amount loose. Then fold the rubber band so it rests on top of the tape and tape firmly in place (this prevents the rubber band from slipping).
5. Stretch the rubber band slightly and then attach other end to the top of the finger using the same method.



- Repeat Steps 4 and 5 for the other fingers. (You might need to use two rubber bands on the larger fingers.) The side with the rubber bands will become the back of the hand.



- Cut 15 pieces of drinking straw approximately 15mm long (you will need 3 for the small finger and 4 for the other fingers).
- Turn the hand over and position the pieces of straw on the hand as shown in the photos. There should be a piece of straw below where you made the cuts for the fingers. Use tape to fix the straw pieces.



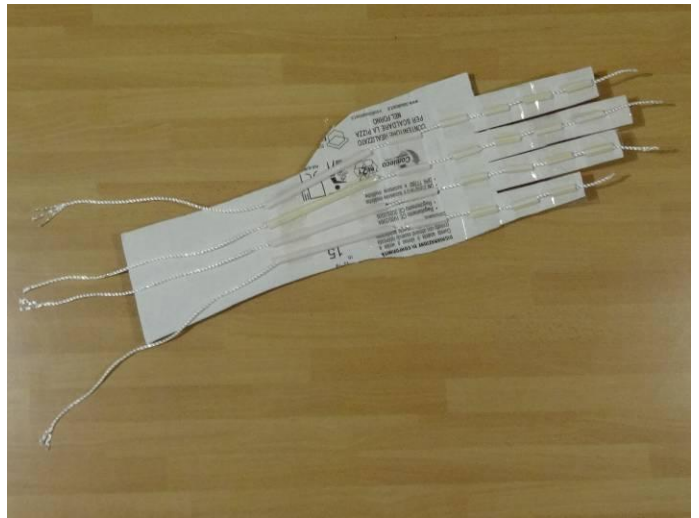
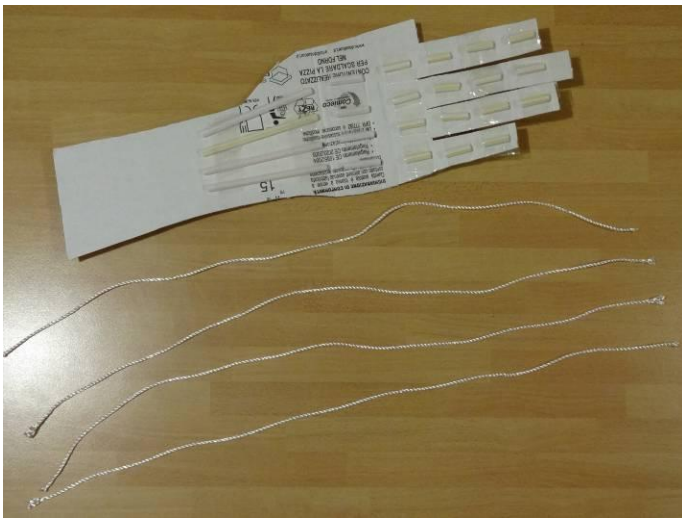
9. Bend each of the fingers and the palm above and below the straw sections. Use the ruler to help.



10. Cut 4 longer sections of straw approximately 100mm and stick to the wrist and palm of the hand.



11. Cut 4 pieces of nylon cord longer than the length of your hand. Thread each of these along one of the wrist straws and the corresponding finger straw sections. Pull the cords so they hang over the end of each finger.



12. Tape the end of each nylon cord to the back of the finger. In the same way as you did with the rubber bands (stick the nylon cord down and leave the end loose then fold the loose bit over and tape firmly in place (this prevents the cord from slipping).



Your robot hand is now complete!! Pull each cord to move the fingers. Try pulling all at the same time to pick up a cup!