

Robotic Hand

* What You Need:

1 x Crazy Circuits Bit Board	Cardboard
1 x micro:bit	Drinking Straws
3 x 270° LEGO Compatible Servo	Rubber Bands
3 x Crazy Circuits Potentiometer Chips	String or Thread
1/8" Maker Tape	Hot Glue Gun
3 x LEGO Beam with Axle Holes	Desktop Stapler
2 x LEGO Baseplate	Tape (Masking Tape or Painters Tape)
Misc. LEGO Pieces	

* How it Works:

We're going to assemble a hand using cardboard and then attach four fingers and a thumb that will flex to close just like a human hand.

Our hand will be a much simpler version and use strings to pull the fingers closed, and rubber bands (on the back) to allow the fingers to move back to their extended position. We'll also use short pieces of drinking straws to guide the strings.

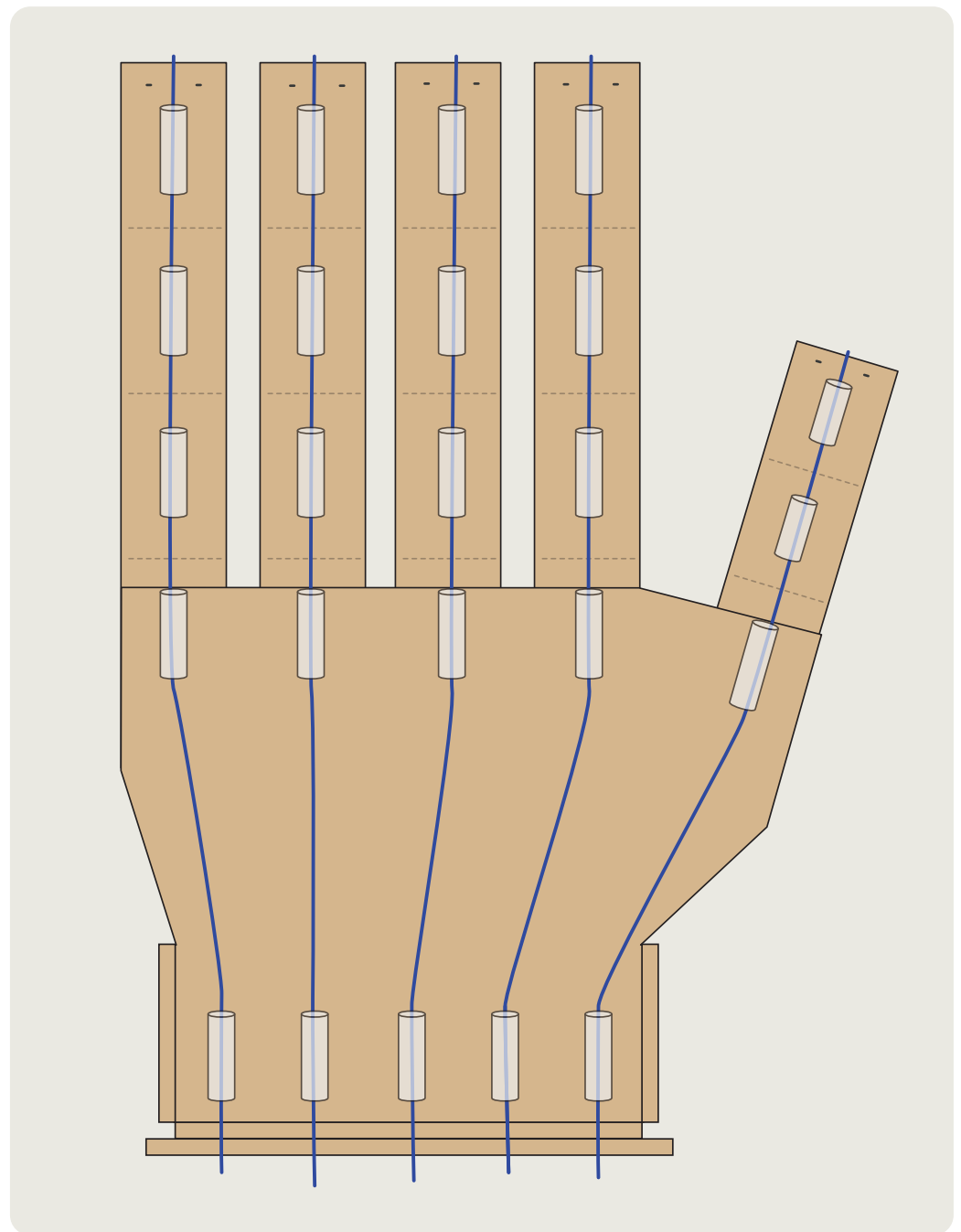
With a Bit Board and micro:bit we'll be able to control three servos so we can make the fingers close. (With only three servos to control five fingers that means we'll group two fingers to one servo, two fingers to another servo, and then give the thumb its own servo.)

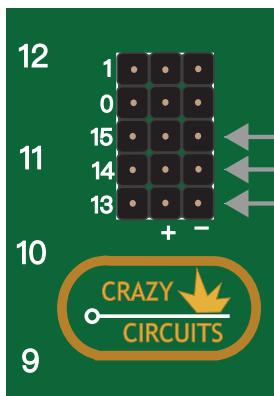
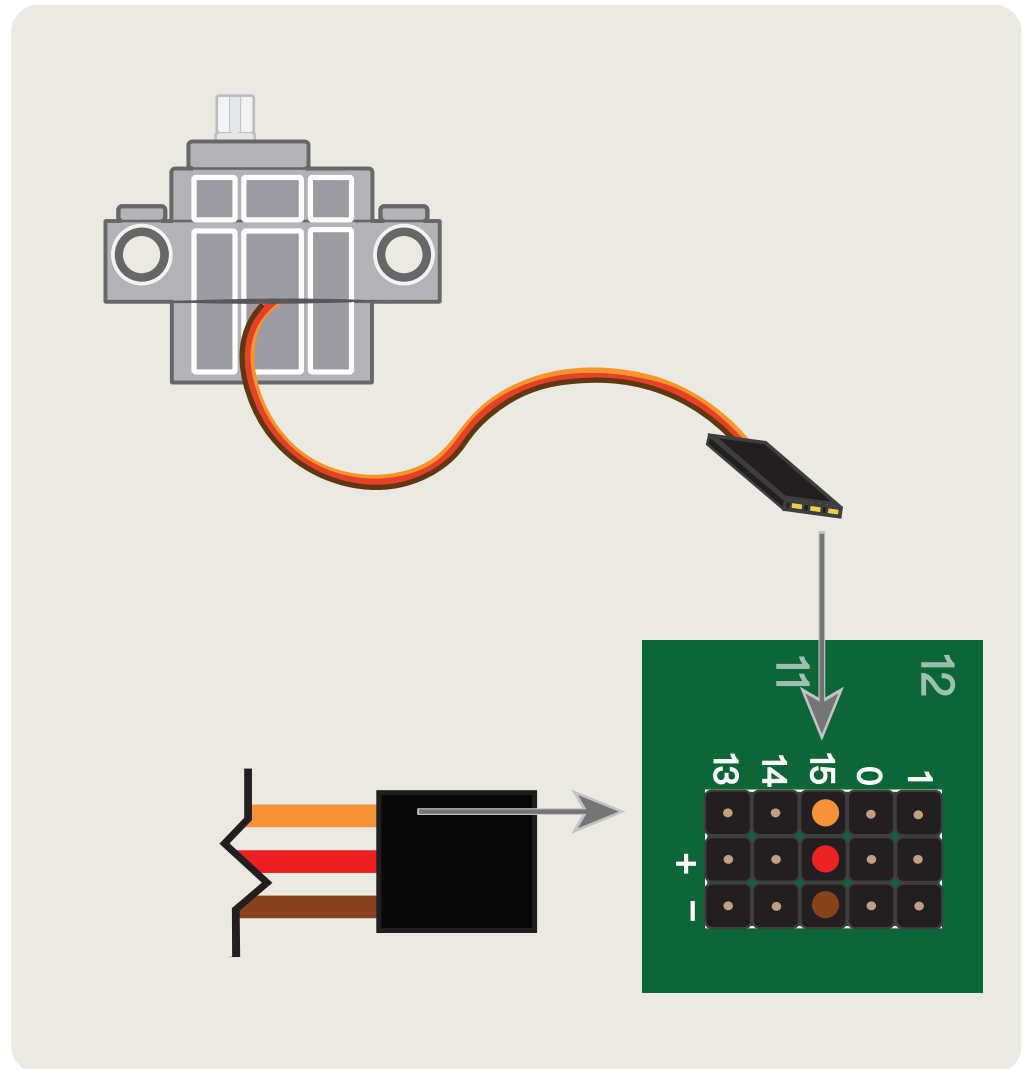
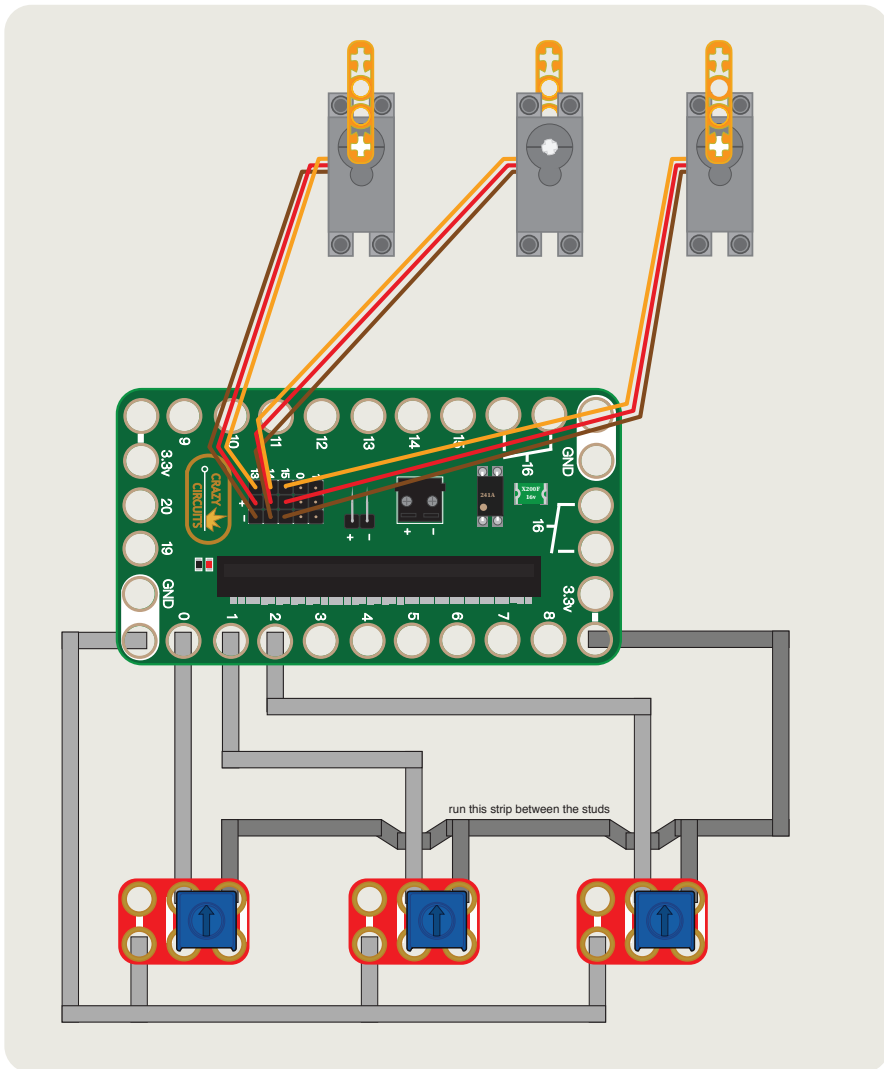
Cardboard is a great material for this project since it's free (or cheap) and readily available. It may take a few attempts to get the cuts just right so having spare pieces of cardboard on hand is recommended.

There is plenty of room for experimentation with this build. You can try different straw placement, finger angles, alternative materials, etc. With any project, the goal of trying things, observing what happens, and learning from the experience is all part of the process.

Check out the circuit diagram on the next page for how we'll connect our servos and potentiometers to the Bit Board to control our hand!

⚠ Note: This is an intermediate/advanced project! It requires cutting and gluing, and safety should be taken into consideration when using knives and hot glue guns. Adult supervision is recommended for the cutting and gluing portions of the build.





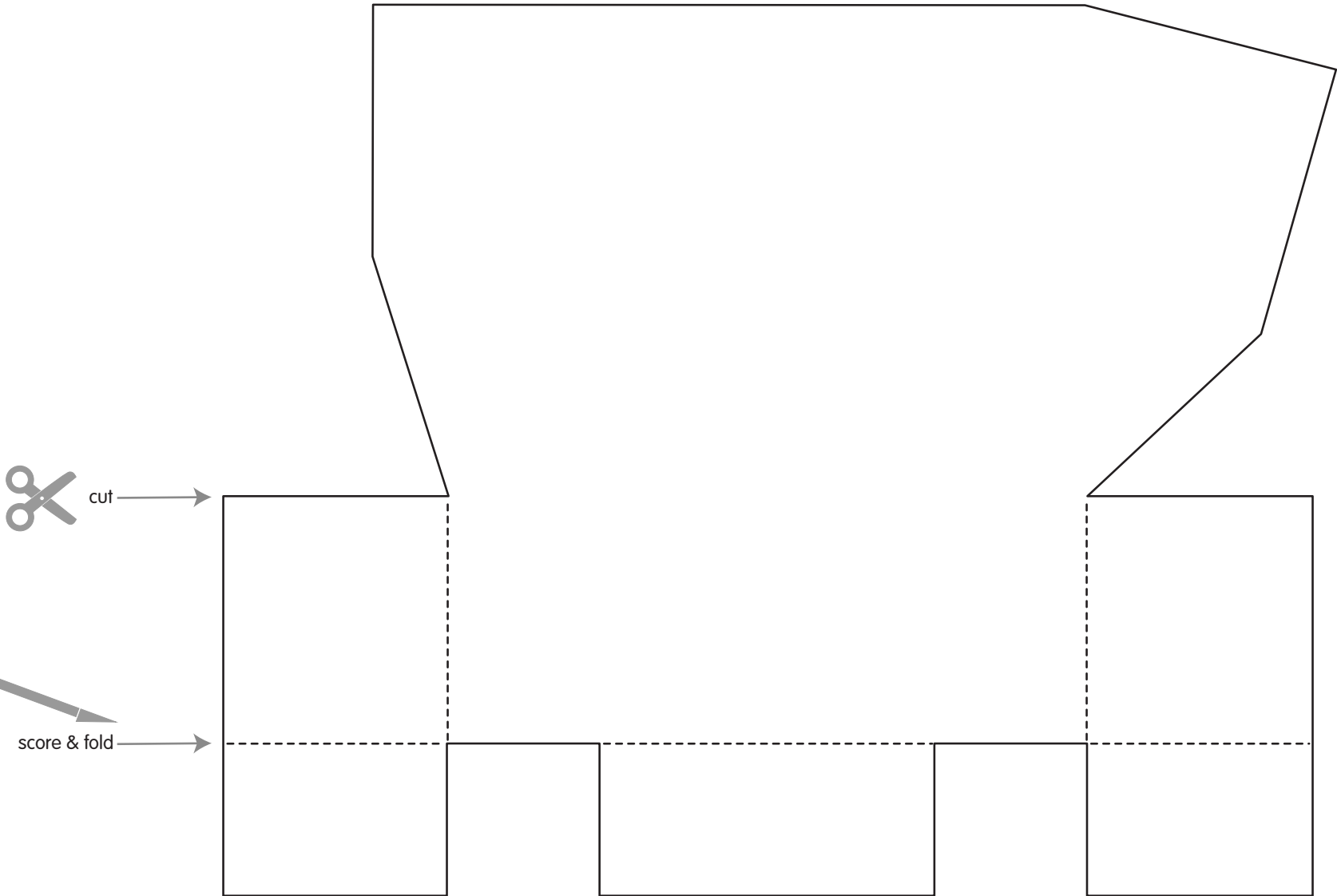
Plug the servo connector for the thumb into the Pin 15 row. The orange wire goes into Pin 15, the red wire into the + (positive) column, and the brown wire into the - (negative) column.

Then plug the index and middle finger servo into Pin row 14, and the ring and pinky finger servo into Pin row 13.

The pins in the + (positive) column are all connected together and go to the 3.3v power supplied to the Bit Board.

The pins in the - (negative) column are all connected together and go to the common ground connection of the Bit Board.

Hand



Base



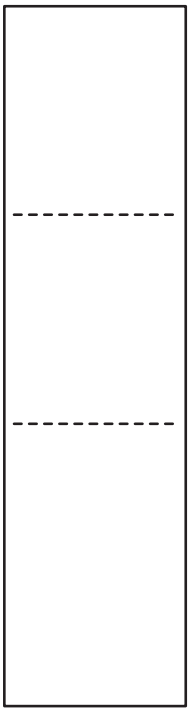
cut



Fingers & Thumb



cut



score & fold

