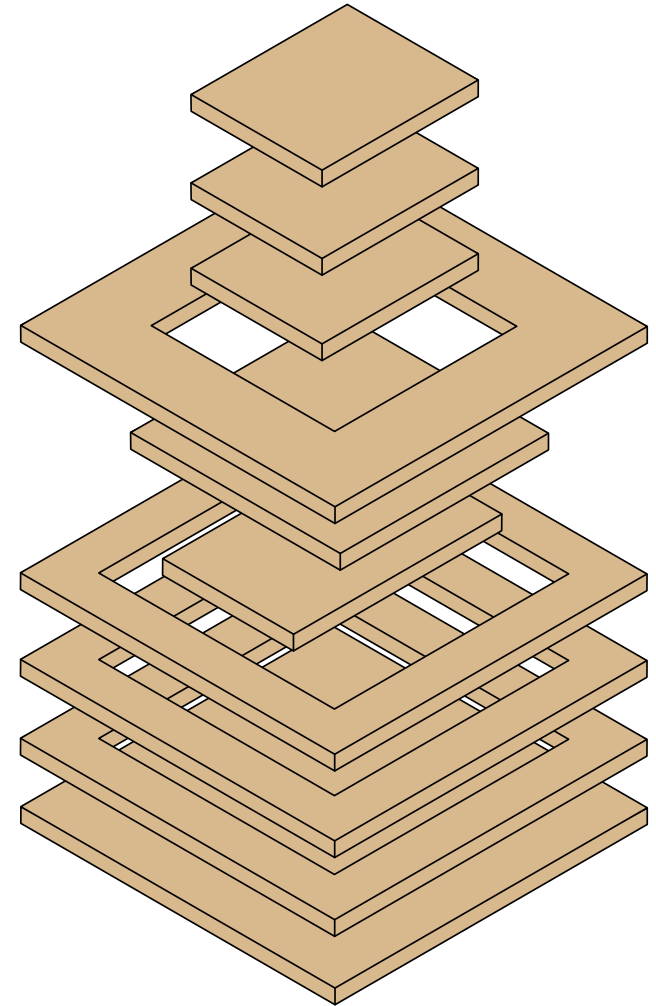
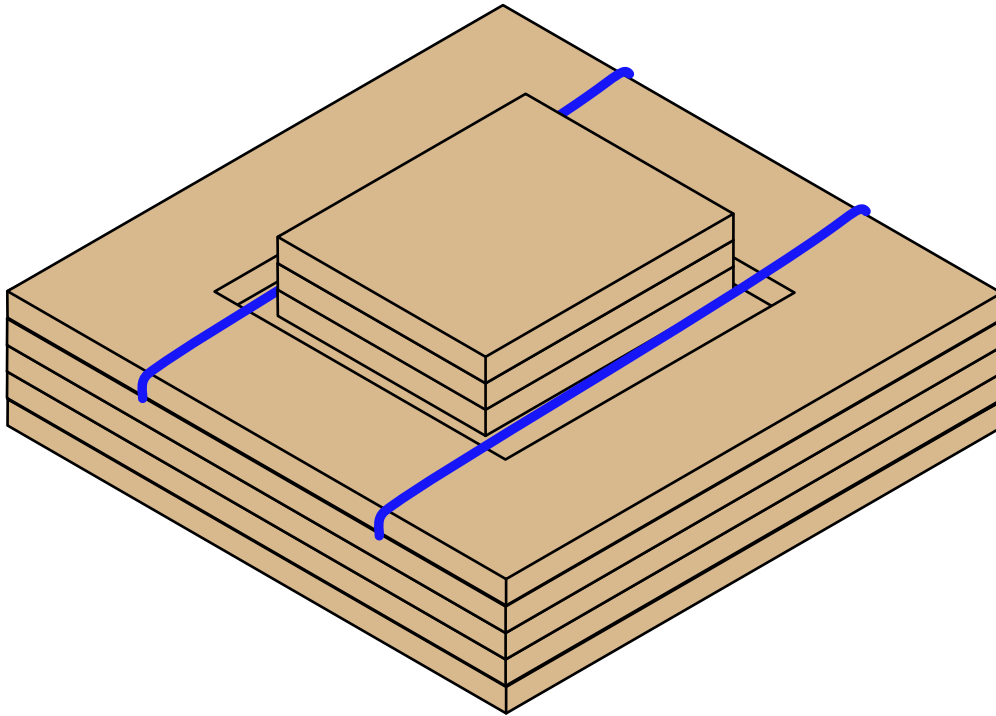


Cardboard Push Button



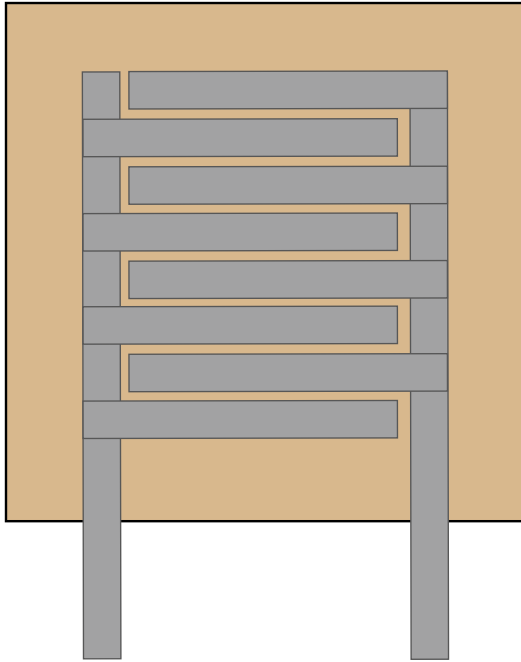
Assembling your own push button switch allows you to see all the parts of an electrical switch and understand how they work together to close a circuit.

Most switches are made with metal (a conductor) and plastic (an insulator) but we'll assemble this one using Maker Tape as the conductor and cardboard as the insulator and housing.

Since this button consists of stacked pieces you can easily scale it up in size to make a LARGE push button. (You can also scale it down but at a smaller size it may be a bit more difficult to assemble.)

Start this project by printing the templates at the end of this file and cutting the pieces from cardboard. Once that's done, keep reading!

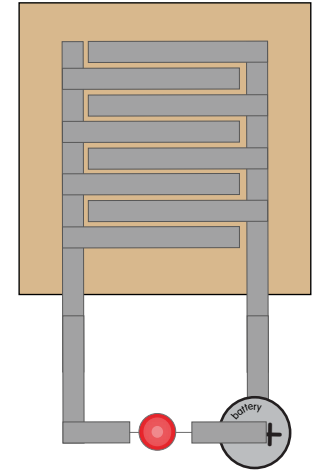
Cardboard Push Button



Attach 1/4" Maker Tape to Piece 1 as shown.

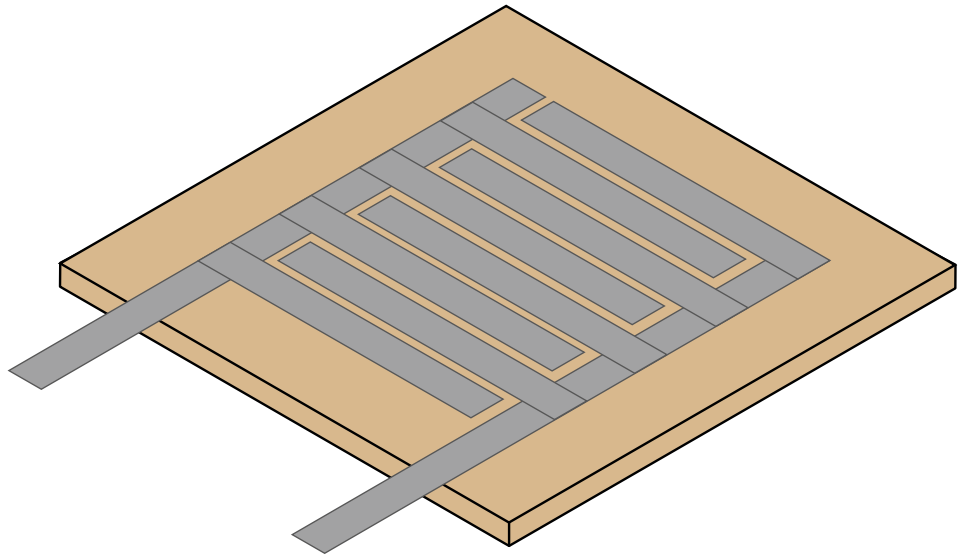
This will form the two connection points for the push button. When using this in a circuit the two connection points will be in series with a circuit. For instance, if you wanted to use the push button to turn on an LED with a battery the two connection points would go between the LED on either the positive or negative side of the circuit.

Since Piece 1 is the bottom layer of our switch it will act as the "Stationary Contact" part of the switch.

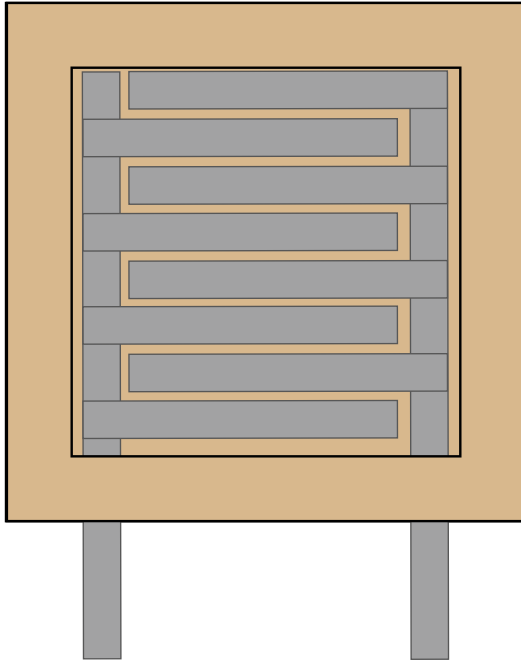


The interleaved pattern of the tape helps ensure that the "Movable Contact" part that is pressed down to complete the circuit has multiple points of contact for a good connection.

Make sure you do not overlap any tape between the two sides or you'll create a "short circuit" in your switch!



Cardboard Push Button

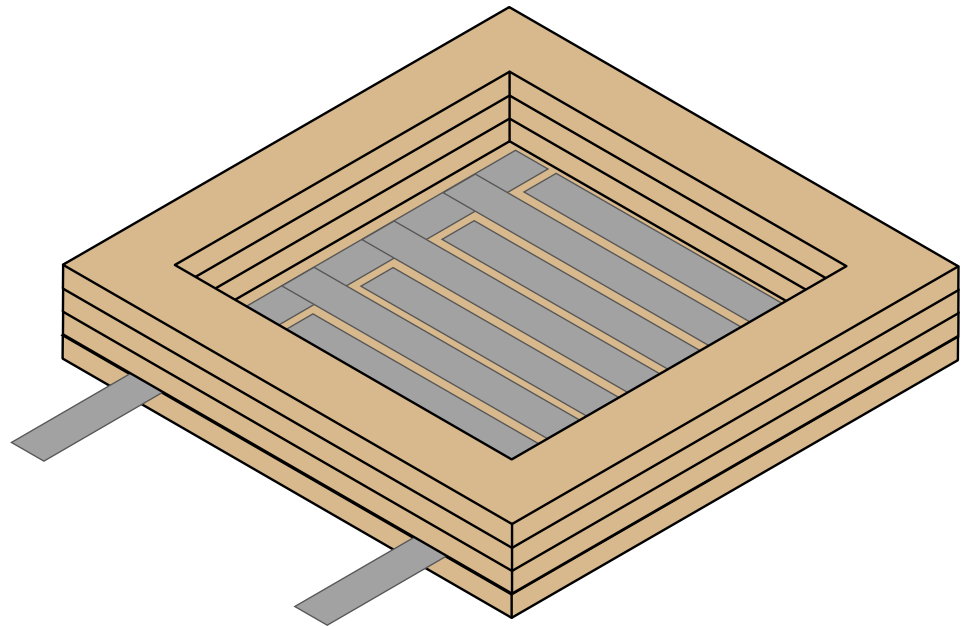


Attach Pieces 2, 3, and 4 to Piece 1 by stacking and gluing them together. (You can also use tape instead of glue if desired.)

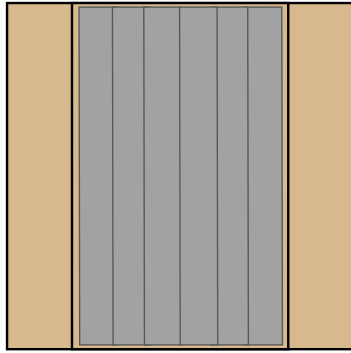
This will form the bottom half of our button, and the inside cavity that the Movable Contact will be placed in so it can be pressed down to touch the Maker Tape on the bottom that forms the Stationary Contact.

Hot glue or standard white glue can be used, or you can choose to use tape. Do your best to align the pieces with each other so things fit together properly.

The two pieces of Maker Tape that act as the contacts can be folded over on themselves or wrapped around the bottom of the button as "tails". As long as we can attach more Maker Tape or alligator clips later, either method will work.

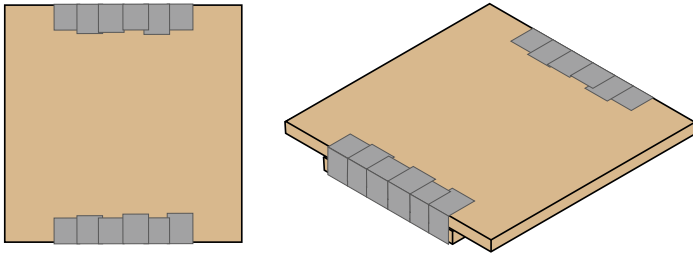


Cardboard Push Button



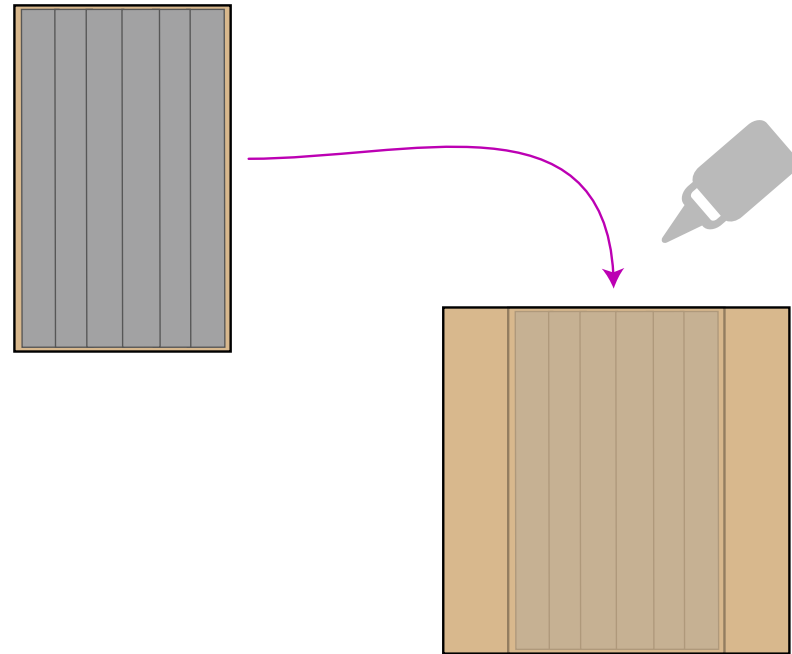
Attach Maker Tape to one side of Piece 5, covering the entire side, then glue the other side (without Maker Tape) to Piece 6, centering it.

This will form the Movable Contact which will be pressed down against the interleaved Maker Tape on the bottom layer of the button to complete the electrical circuit.

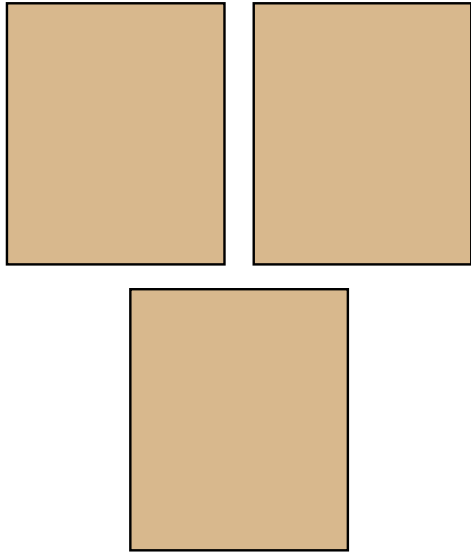


If you are avoiding glue for this button you can easily use the Maker Tape to hold the two pieces together. Just wrap the tape around the edges to secure both pieces of cardboard as a single unit.

We do want to leave some cardboard exposed on the top piece so we can glue to it in the next step.



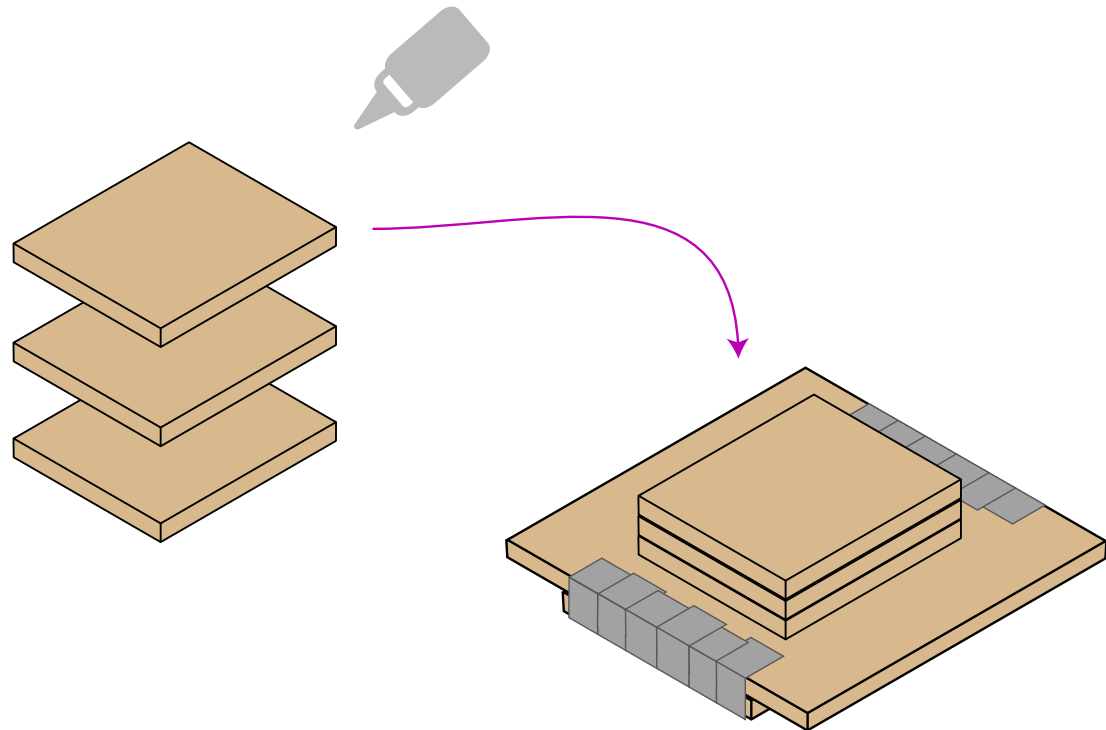
Cardboard Push Button



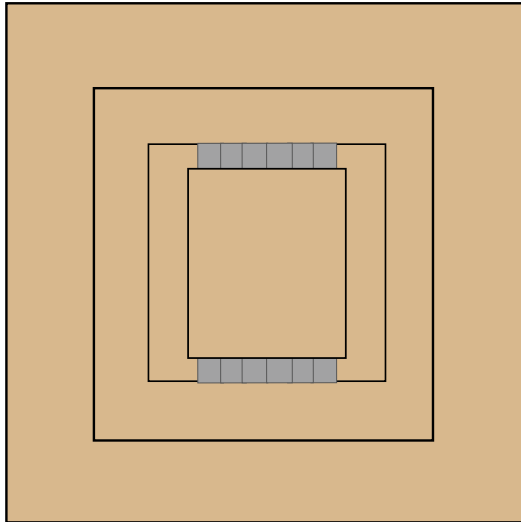
Attach Pieces 8, 9, and 10 to Piece 6 by gluing and stacking them. Make sure the pieces are all centered.

The top of the assembly will be the part of the button you press with your hand (or you can optionally add one more large piece (11) to the top for a larger surface area to press. The bottom of the assembly presses down to close the switch.

Glue will work best for this step but we do love tape! If you apply tape at this step make sure you are not covering the conductive Maker Tape with some other non-conductive tape on the bottom side. (We need our conductivity!)



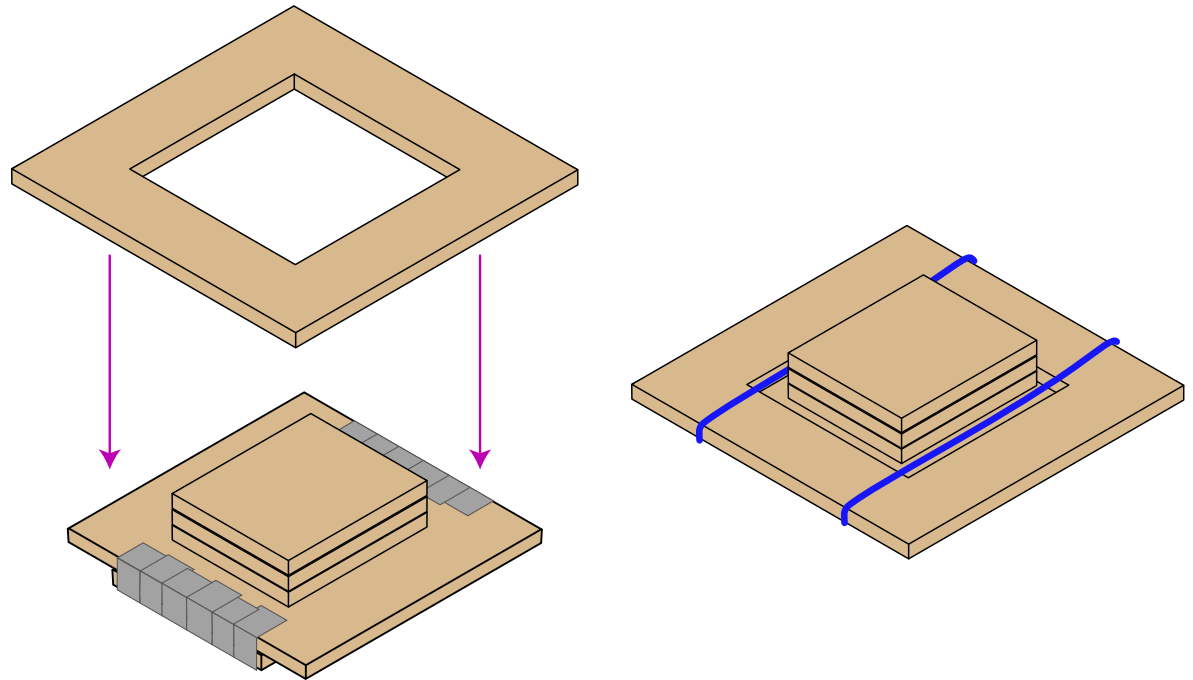
Cardboard Push Button



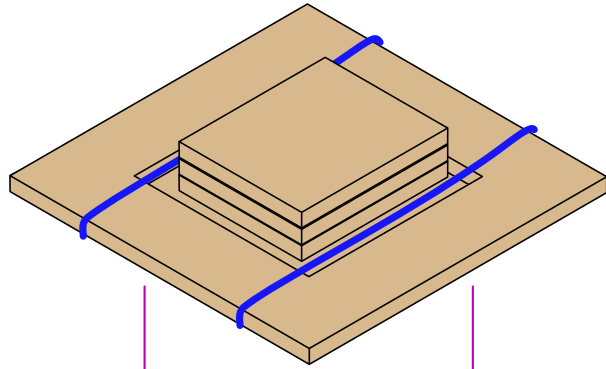
Place Piece 7 on top of the assembly created in the previous steps. The stack of three piece (8, 9, and 10) should stick up through the hole. Hold the pieces together with two thin rubber bands.

Push buttons (and many other types of switches) use springs or a flexible metal strip to provide the “action” needed to return the switch to the “off” position. This style of button is called “Momentary” because it is only on momentarily while you are pressing it. This is different from a standard light switch which clicks into place and remains on (or off) until you activate (or deactivate) the switch again.

The rubber bands are what will allow our button to “bounce back” into the off position after being pressed. Choose rubber bands that are not loose, and not overly tight, but allow for some good springy action. Just enough to pull the Movable Contact piece up and away from the Stationary Contact piece when released.



Cardboard Push Button

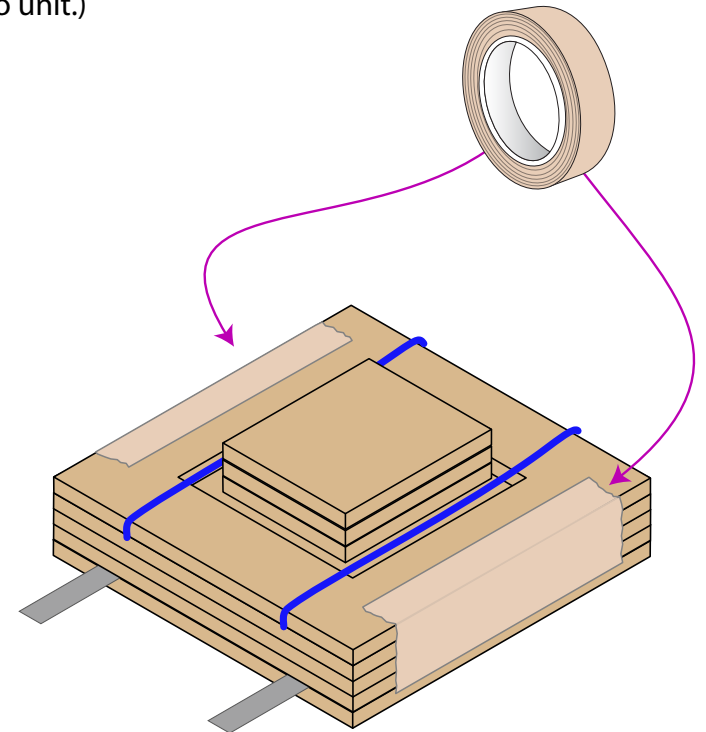
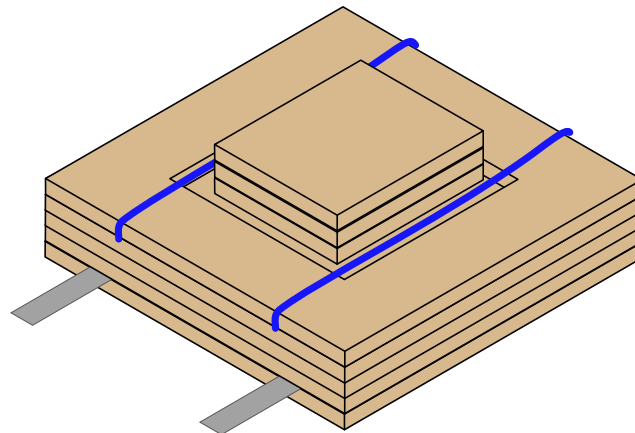
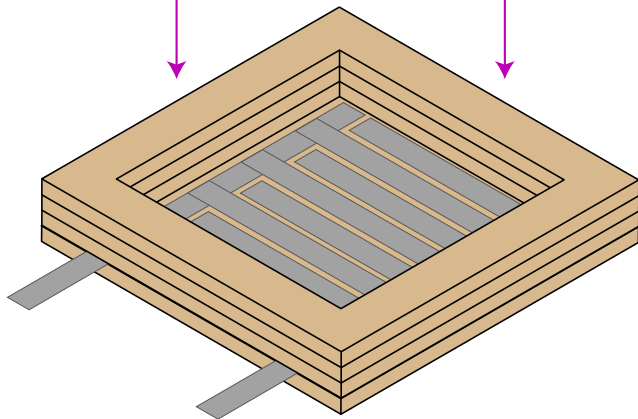


Now that we have the top and bottom parts of our push button we can assemble them together!

You can glue the two halves together, and it will be nice and secure, but if you ever want to open it to show how it works you can't really do so.

We decided to use masking tape to hold our button together. This allowed us to easily peel off the tape if we want to show someone what the inside looks like. (You can also make a second button that isn't fully assembled as a demo unit.)

Hey, we're almost done!

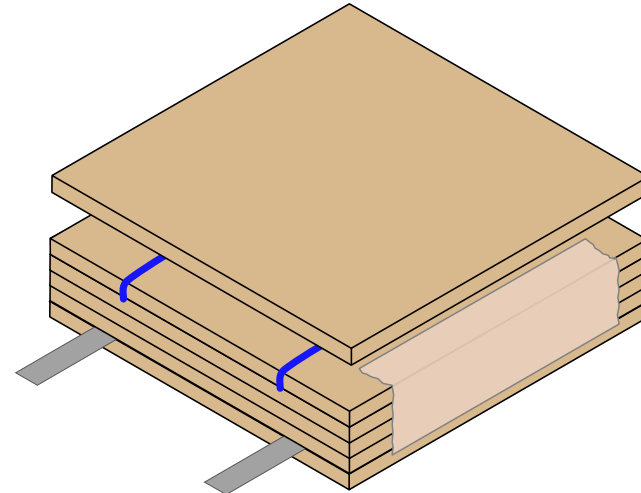
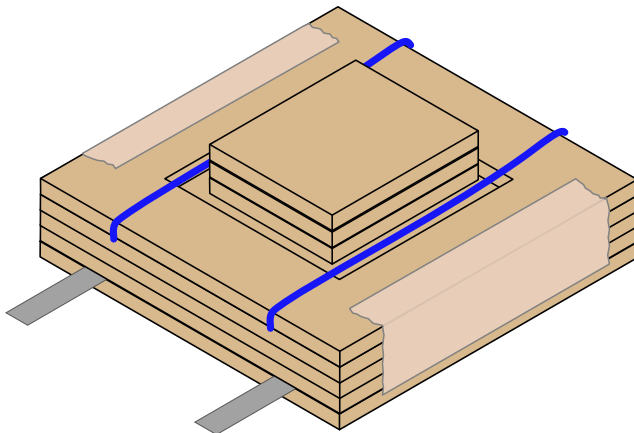


Cardboard Push Button

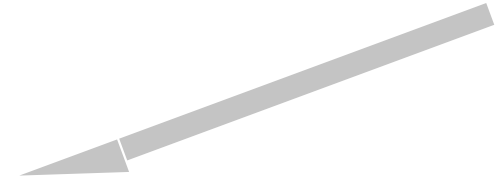
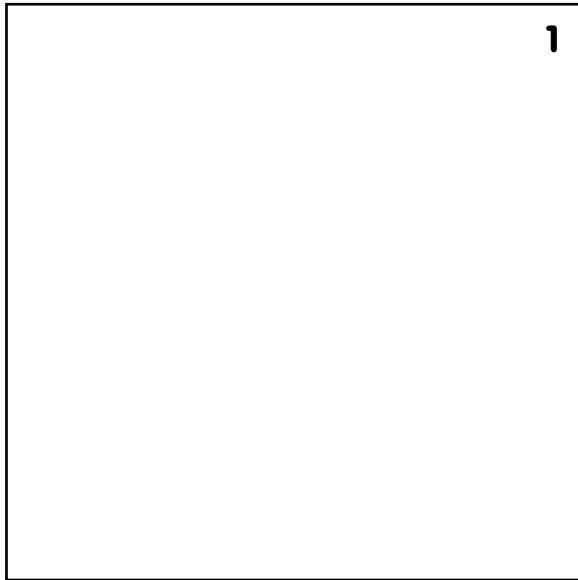
Adding Piece 11 is optional. Your Push Button will work just fine without it, but you can add it on using glue for a nice secure adhesion, or tape for a removable solution.

With Piece 11 attached it tends to hid the insides and the mechanics of the push button, so if you want that, it's an option. Gluing it in place will make it difficult to take things apart, but if you want a permanent button, it's the best choice.

You can also decorate the top! You can color it, attach a photo or drawing, etc. If you have a bunch of buttons you can label them, or color code them, depending on what their functions are. Maybe you want a "Launch" button, or a "Play/Pause" button, or a "Cookie" button... Your imagination is the limit!



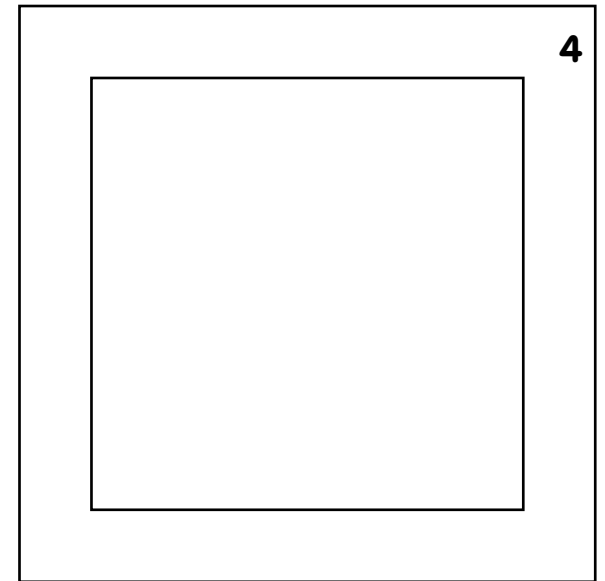
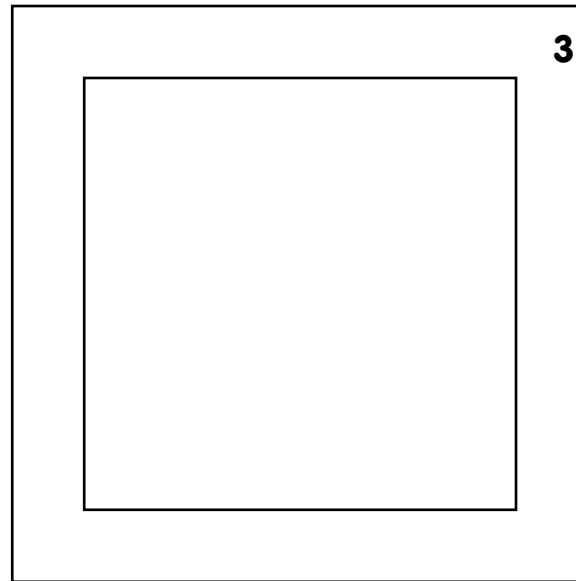
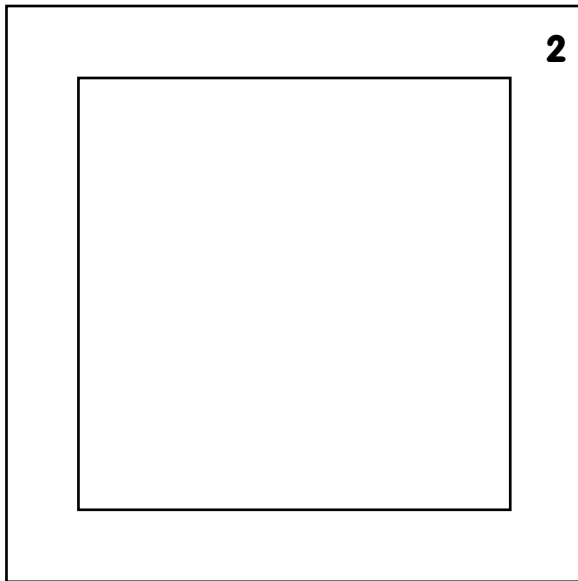
Cardboard Push Button Template - Bottom Half



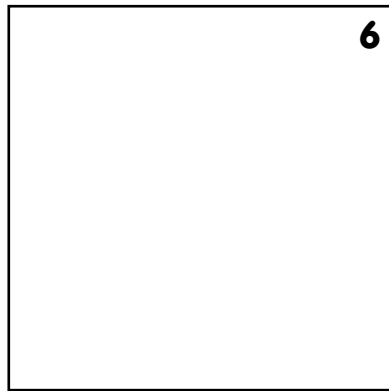
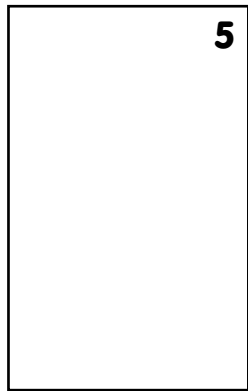
Template Instructions

1. Print this page out to use as a guide.
2. Glue it to a piece of cardboard.
3. Cut out the the pieces.

Pieces 2-4 need holes cut in the center.



Cardboard Push Button Template - Top Half



Template Instructions

1. Print this page out to use as a guide.
2. Glue it to a piece of cardboard.
3. Cut out the the pieces.

Piece 7 needs a hole cut in the center.

