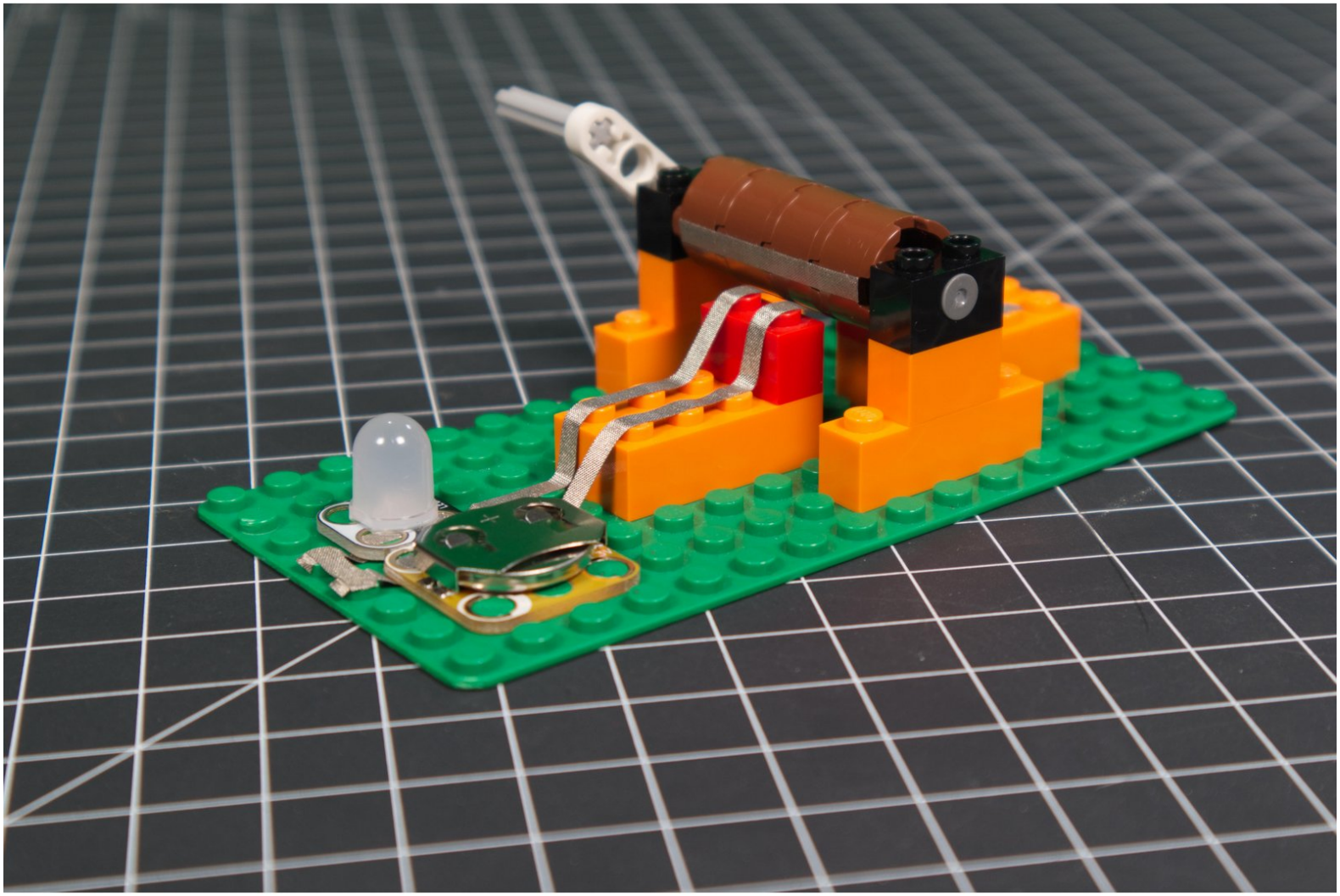
Hand-Cranked Circuit

Create a LEGO-based circuit that is activated by a crank.

Written By: Pete Prodoehl



INTRODUCTION

Create an analog LEGO-based circuit that is activated by a crank.

TOOLS:

- Scissors (1)

PARTS:

- CR2032 Battery (1)
- Crazy Circuits LED Chip (1)
- Maker Tape (1)

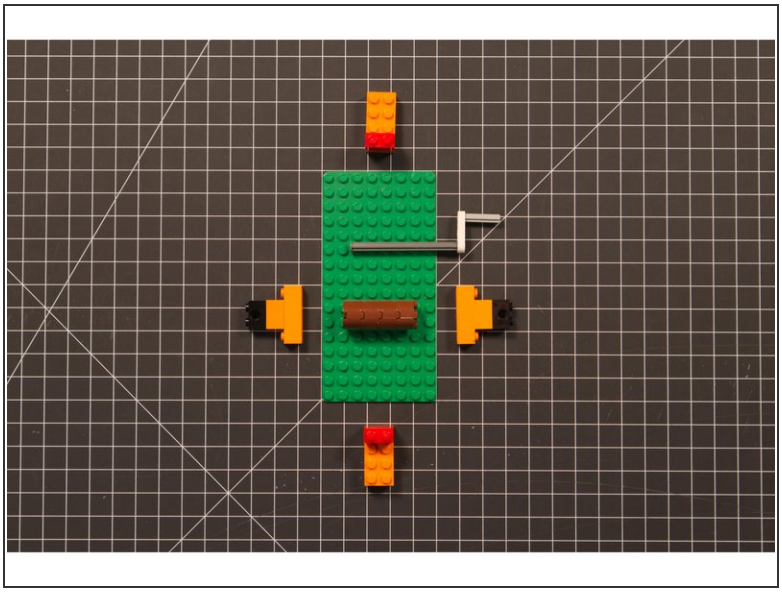
1/8"

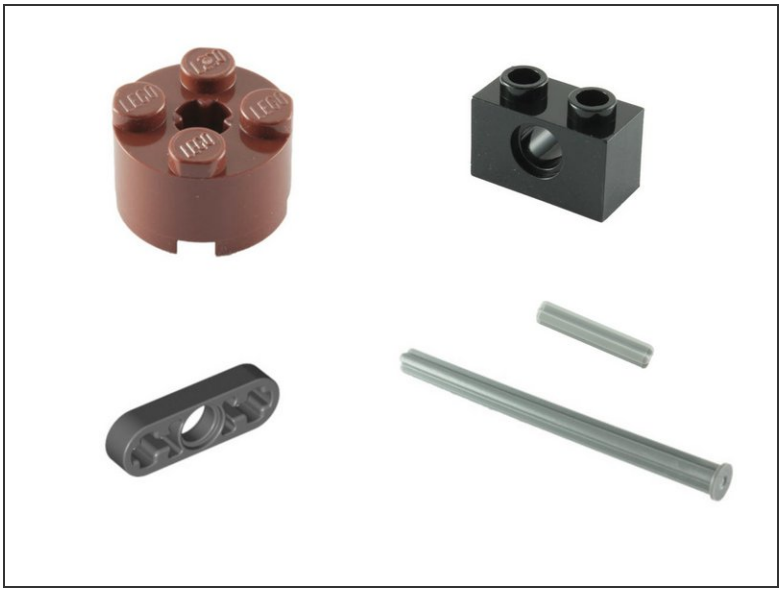
- LEGO Bricks (1)

Misc

- LEGO Brick 2 x 2 Round (3941 / 6143) (4)
- LEGO Technic Brick 1 x 2 with Hole (2)
- LEGO Axle 8 with End Stop (1)
- LEGO Beam 3 x 0.5 with Axle Holes (1)
- LEGO Axle 3 (4519) (1)

Step 1 — Prepare your Parts

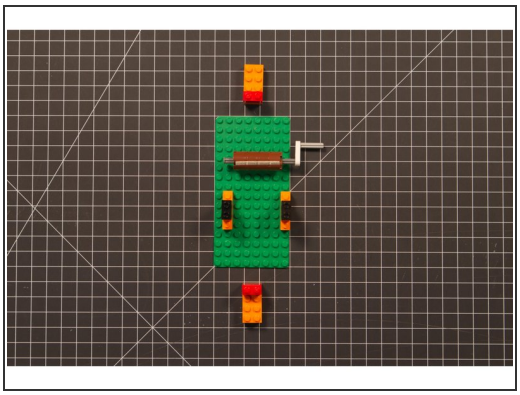
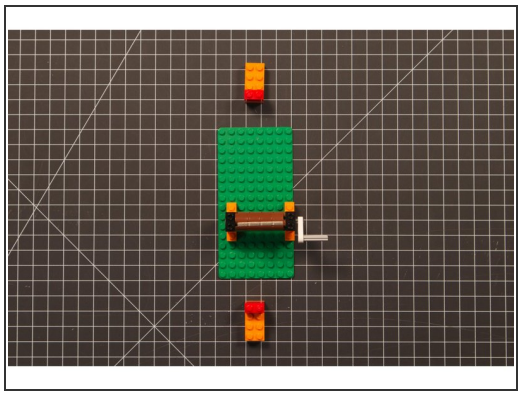
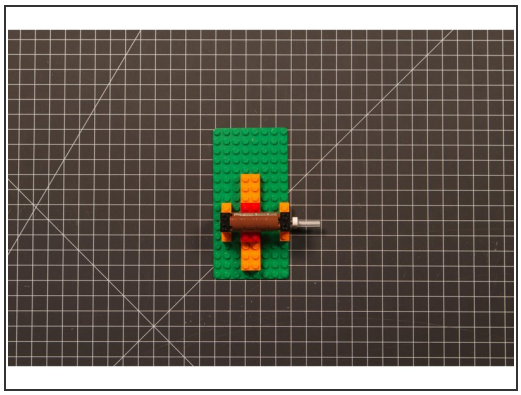




- We've got a LEGO baseplate, a few miscellaneous bricks, and the parts needed to make our rotating cylinder.
- For our rotating cylinder, here are the parts we used: LEGO Brick 2 x 2 Round, LEGO Technic Brick 1 x 2 with Hole, LEGO Axle 8 with End Stop, LEGO Beam 3 x 0.5 with Axle Holes, and LEGO Axle 3.

ⓘ You have a lot of choices when building with LEGO, so if you don't have these parts, others can also work.

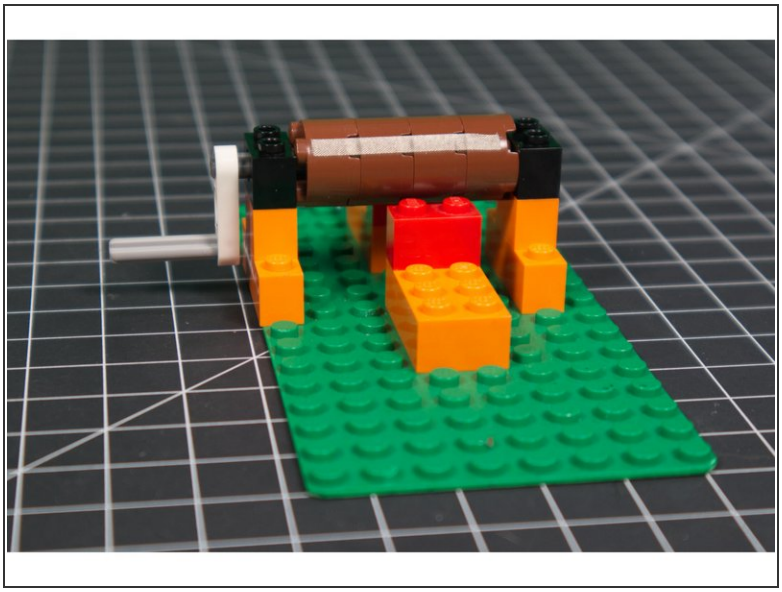
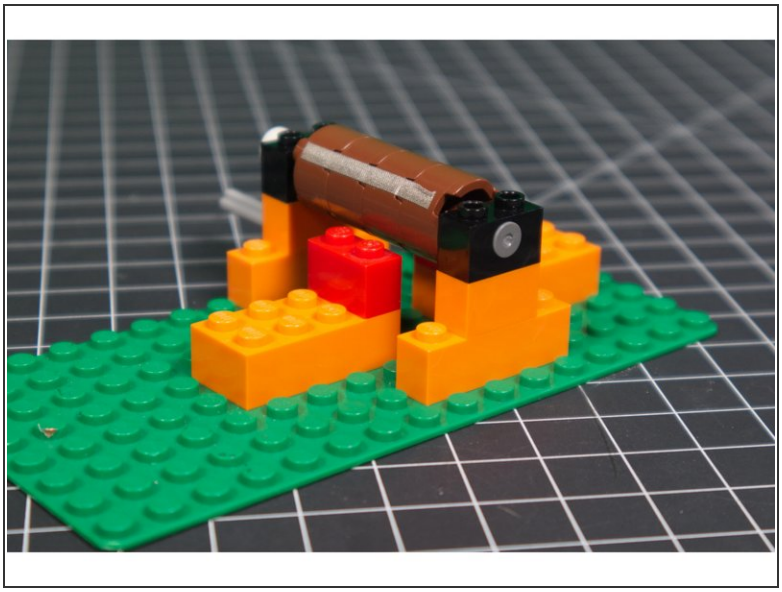
Step 2 — Assemble the Base

- Construction is pretty simple. We've stacked our four round bricks and added two pieces of 1/8" Maker Tape on opposite sides of the cylinder.

ⓘ We've got our shaft in place to show how it will be positioned, but you'll need to remove it to put it through the 1 x 2 bricks with holes.

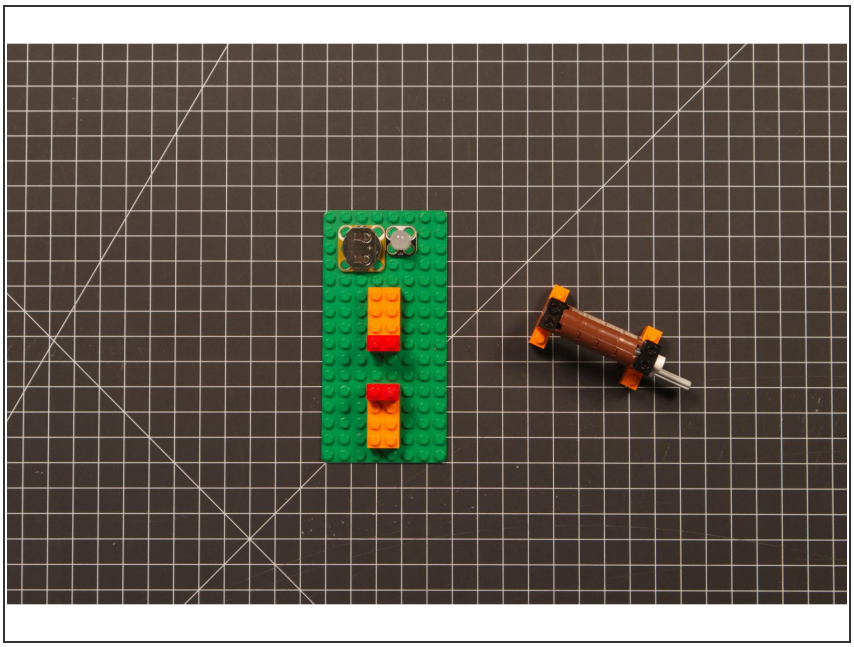
Step 3 — Check the Spacing

- Notice the position of the cylinder in relation to the bricks on the base. We need the cylinder to be able to make contact with the tape we'll be adding.

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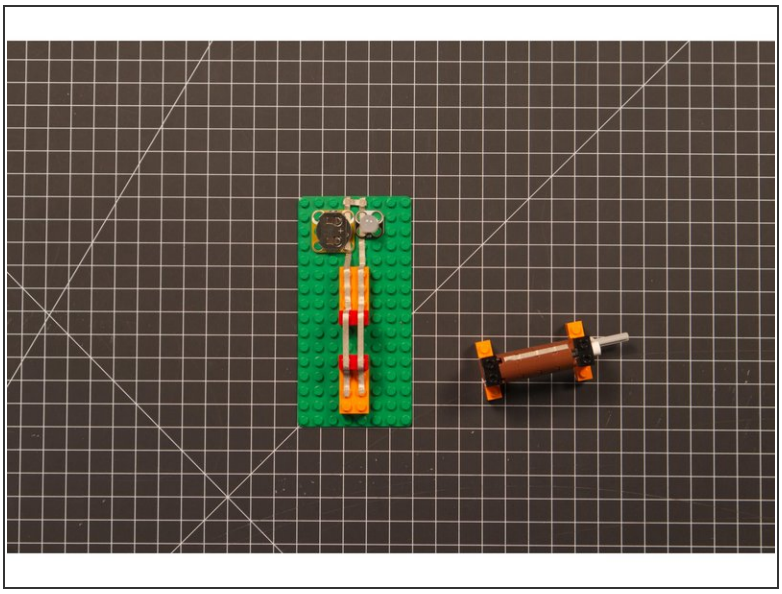
Step 4 — Layout your Circuit

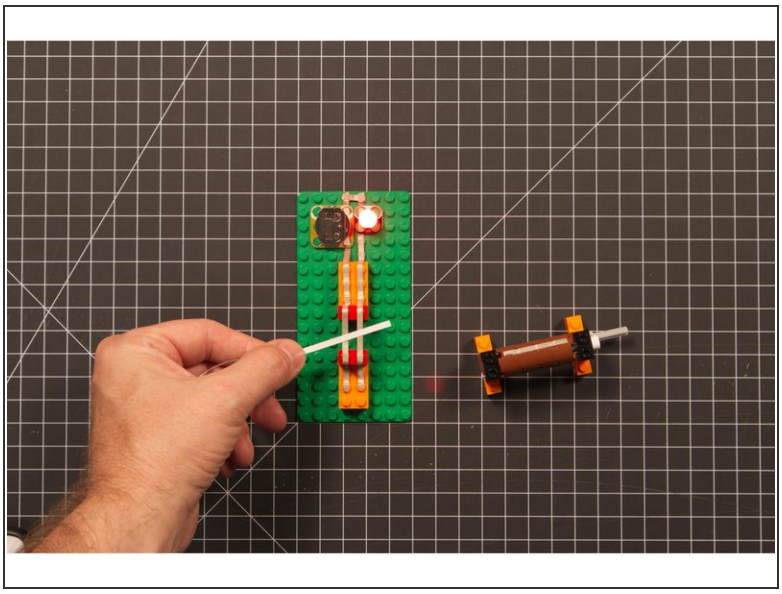


- Our simple circuit will just provide power to an LED from a CR2032 battery when the cylinder turns and makes contact to complete the circuit.
- The ground for the LED and Battery holder should go next to each other so they can be easily connected, and the positive side of the circuit will run across our LEGO pieces.

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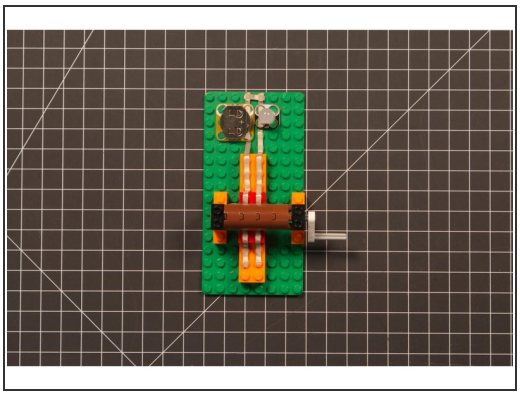
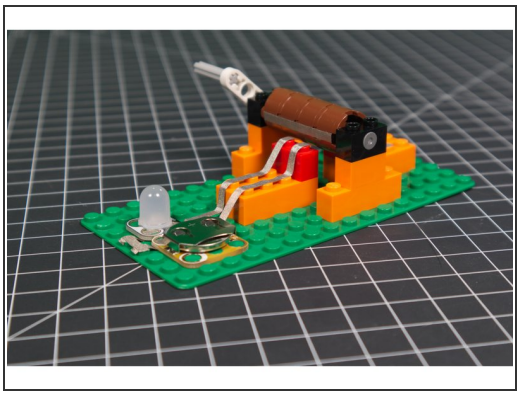
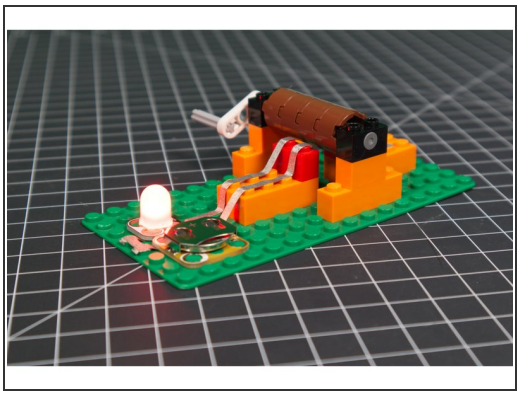
Step 5 — Add the Tape





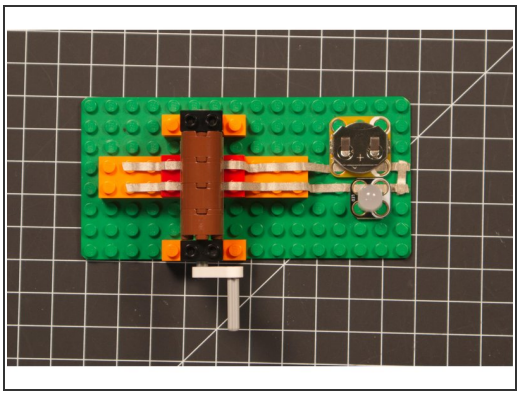
- Run the 1/8" Maker Tape as shown to connect the circuit.
- The two separate pieces which make up the positive side of the circuit do not get connected. (The cylinder makes the connection!)
- You can easily test your circuit by putting a piece of Maker Take across the two separate pieces. Did the LED turn on? If so, you're good to go! (If not, double check your circuit.)

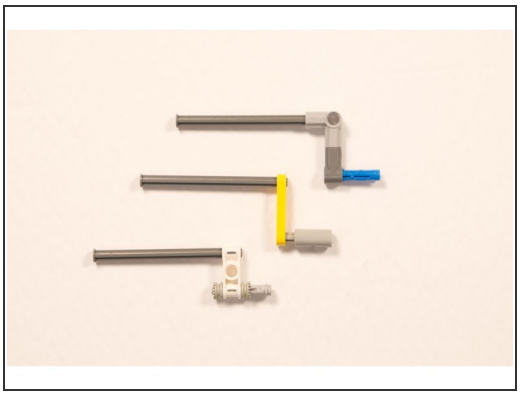
Step 6 — Turn the Crank

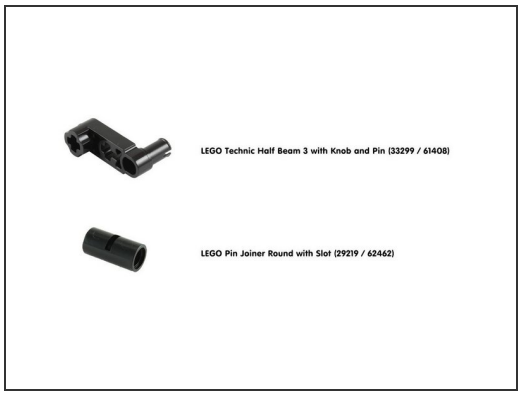




- Once you have all the pieces in place you can turn the crank by hand and see what happens!
- If it works, the cylinder will turn until the tape attached to it completes the circuit and the LED will turn on.
- You can get the LED to blink on and off by turning the crank. Try turning it faster or slower to see how it affects the rate that the LED blinks.

Step 7 — Taking it Further







- This is a very simple mechanism, and we've got a few more complex versions in the works. It's easy to expand this to add more than one action, and we can even control digital circuits.
- There is such a great variety of LEGO components that you might be able to make an even better crank!

So far our favorite crank is made with two pieces. The LEGO Technic Half Beam 3 with Knob and Pin (33299 / 61408) and the LEGO Pin Joiner Round with Slot (29219 / 62462)

If you want to explore this concept further, check out our Larson Scanner with 7 LEDs.