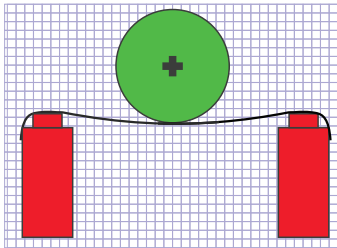


Larson Scanner (Analog, Hand-Cranked, LEGO-Based)

Components:

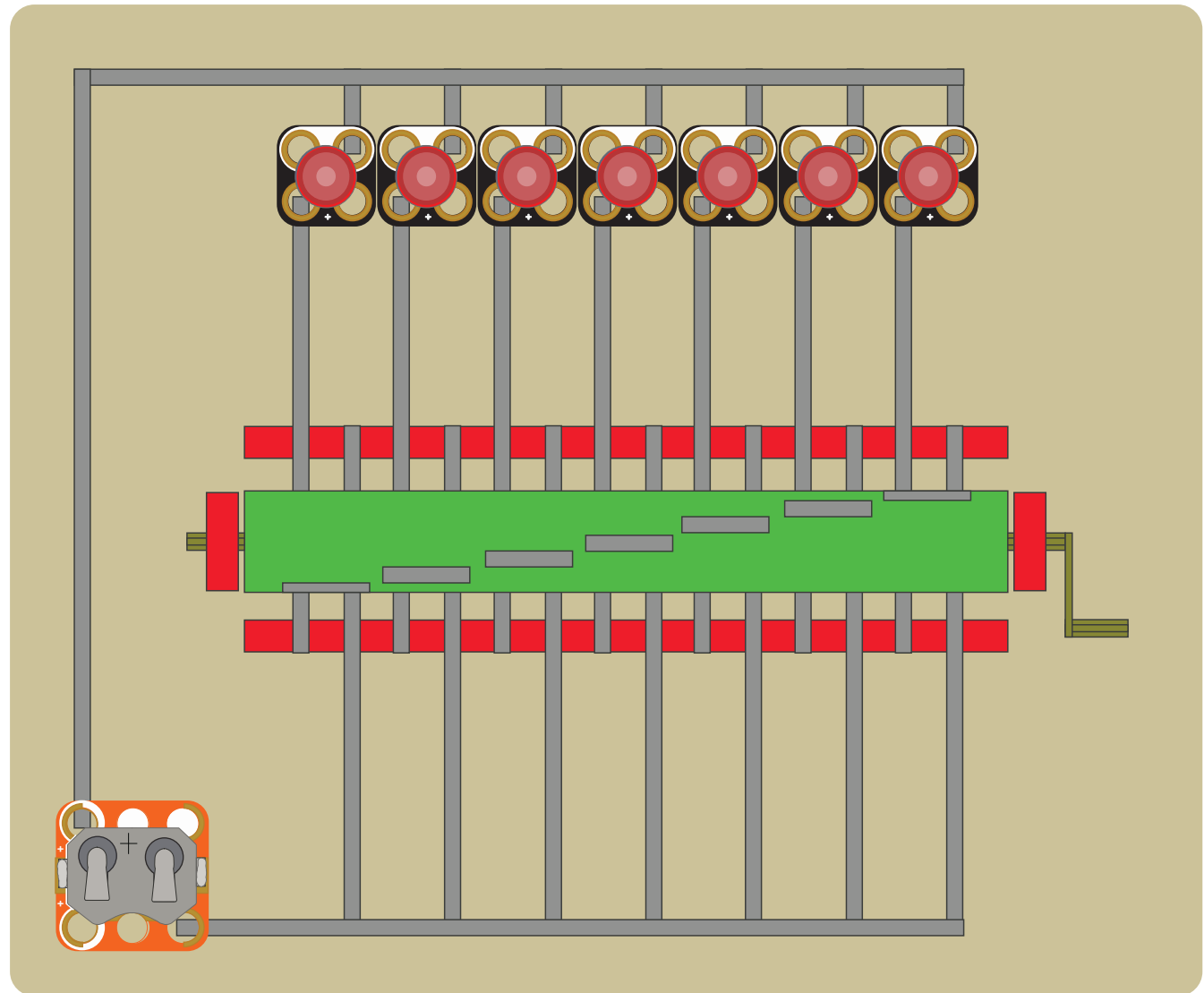
- 7 x Crazy Circuits Jumbo 100 RED LEDs
- 1 x Crazy Circuits CR2032 Battery Holder
- 1/8" Maker Tape
- LEGO Baseplate
- LEGO Bricks (Misc)
- 12 x LEGO Brick 2 x 2 Round
- 2 x LEGO Technic Brick with Hole
- 2 x LEGO Axles (Long)
- 1 x LEGO Axles (Short)
- 1 x LEGO Beam with Axle Holes

Note: As with all LEGO builds, there are a variety of parts that will work. Our list above is just an example of some of the pieces that we used.



Tape Gap:

Build up enough height with LEGO pieces so that the tape running across the gap is just slightly pressed downward by the cylinder. The tape will flex a little, but make sure it is taut as this will ensure you get good contact between the tape strips across the gap and the tape strips on the rotating cylinder.



The Cylinder

To the right you'll see three different views of the cylinder that rotates to complete each individual circuit which turns on the LEDs.

The **Cylinder Top View** shows what the cylinder looks like if you were to look at it in the real world. You can see about half of the cylinder from a top view, but you can't see the bottom side.

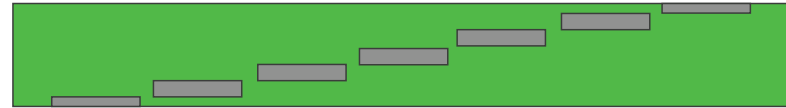
The **Cylinder Unrolled View** shows what it would look like if we could "unroll" the cylinder and lay it out flat. It appears to be just over three times as tall as the **Cylinder Top View**.

Why is the **Cylinder Unrolled View** a little more than three times as tall as the **Cylinder Top View**? Because we can determine the circumference of a cylinder by multiplying the diameter by Pi, which is 3.14159265359. If our cylinder is 10 millimeters in diameter the circumference would be 31.45 millimeters, or 3.145 centimeters.

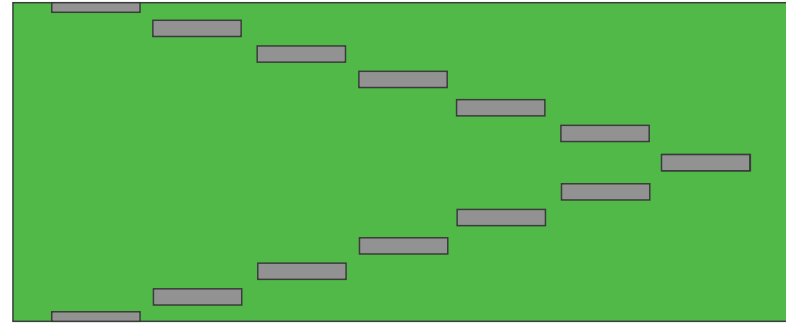
The **Cylinder Repeating View** shows how the pattern repeats as the cylinder continues to turn. Just as you can see the pieces of tape zig-zag back and forth, you'll also see the LEDs turn on and off in a pattern from left to right and back to left to start over again.

Could you change the pattern created by the tape to affect how the LEDs light up? You sure can! You could make LEDs 1,3,5,7 turn on while LEDs 2,4,6 are off. These are known as "chase lights" and were often seen on movie theater marquee signs. Before affordable advanced electronics were available such lights were controlled similar to how we are doing it here with a rotating cylinder providing power to a set of light bulbs.

Cylinder Top View



Cylinder Unrolled View



Cylinder Repeating View

