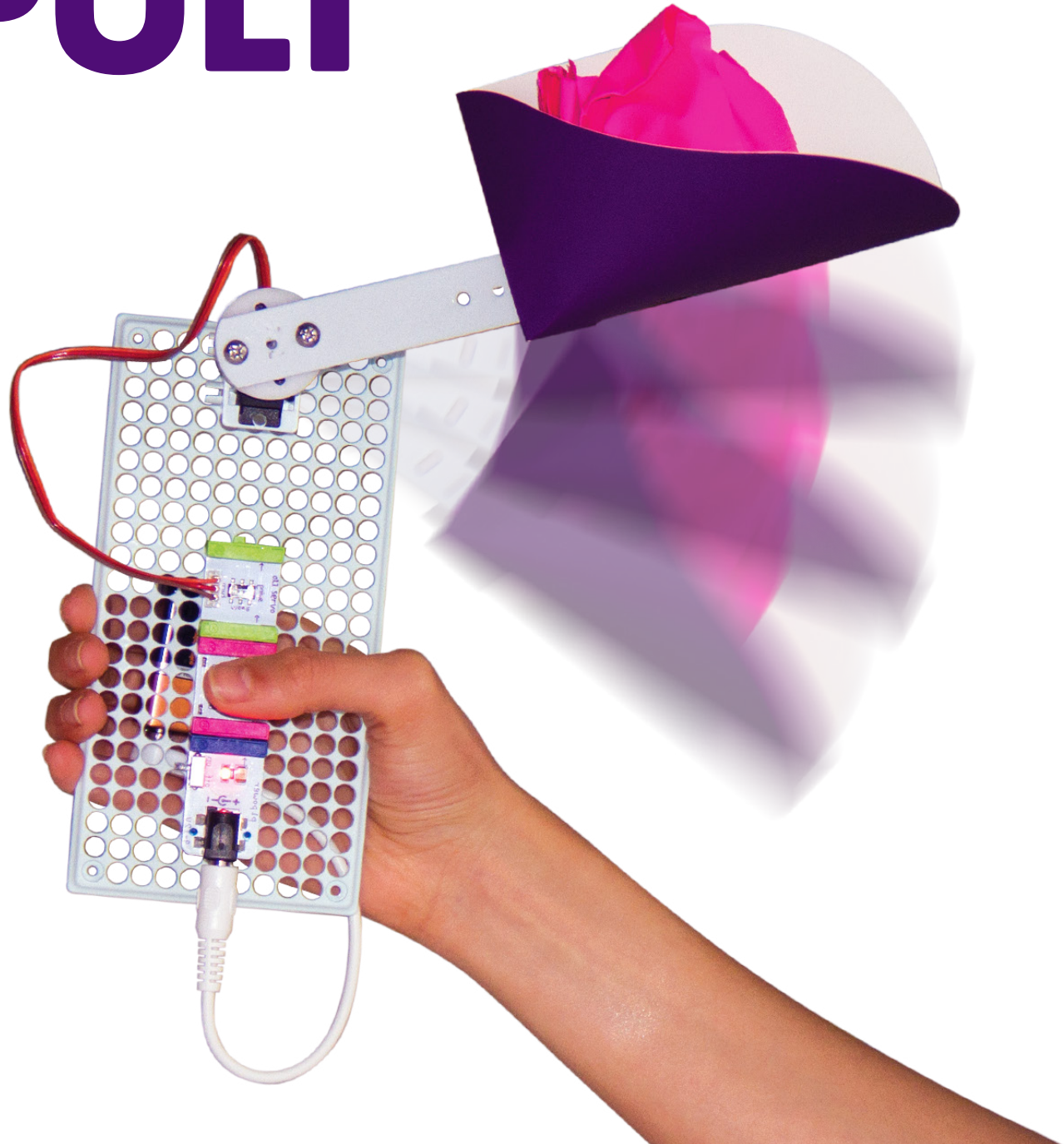


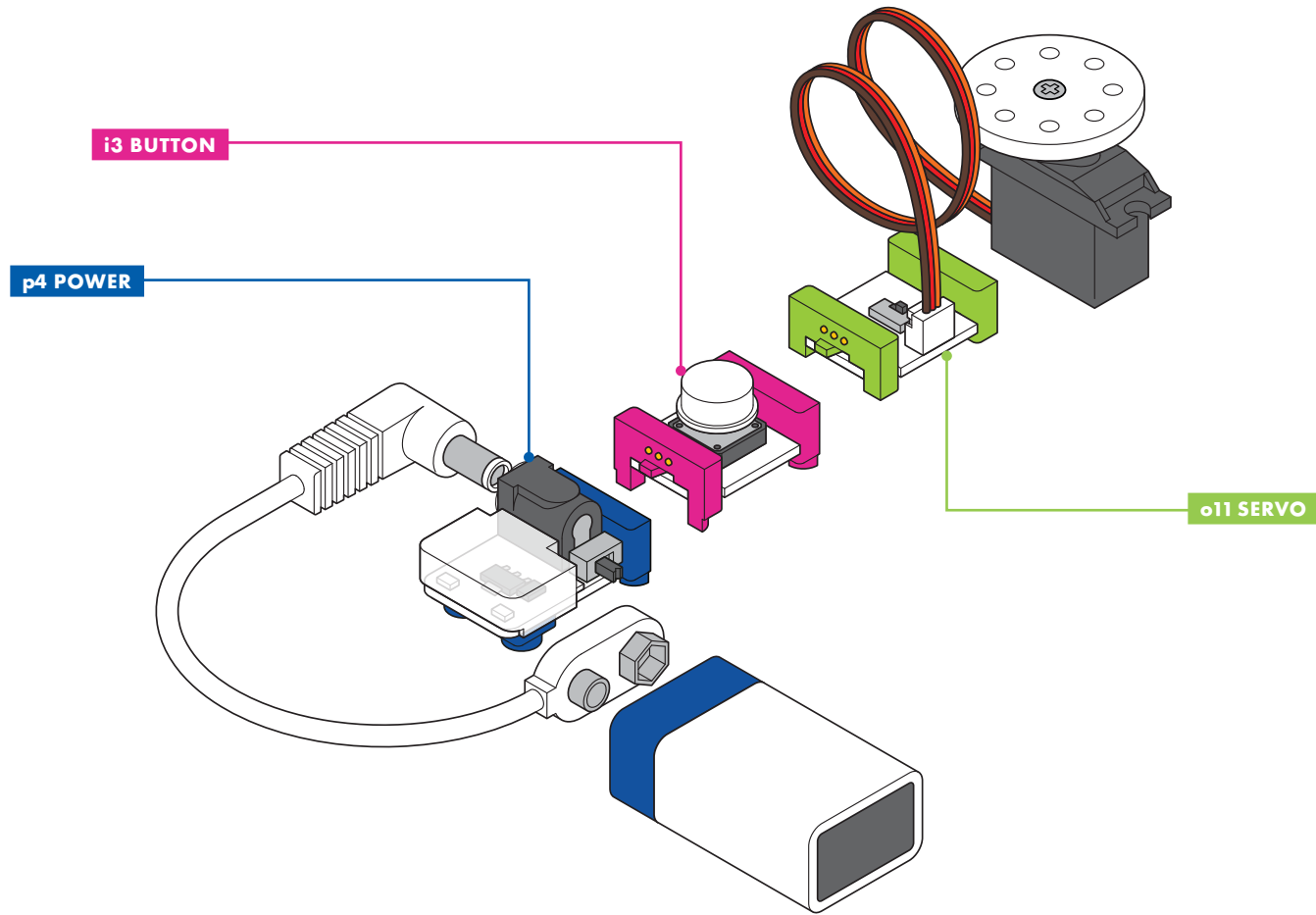
INVENTION #2

CATAPULT



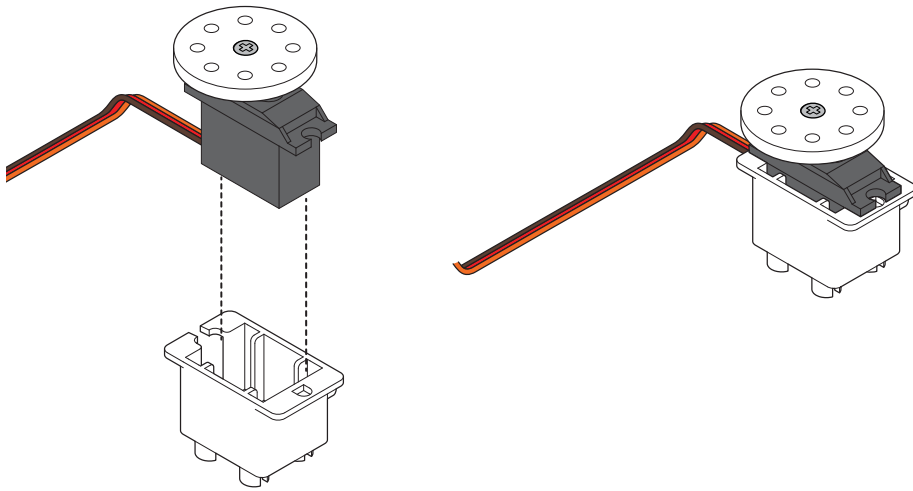
1

BUILD YOUR CIRCUIT.



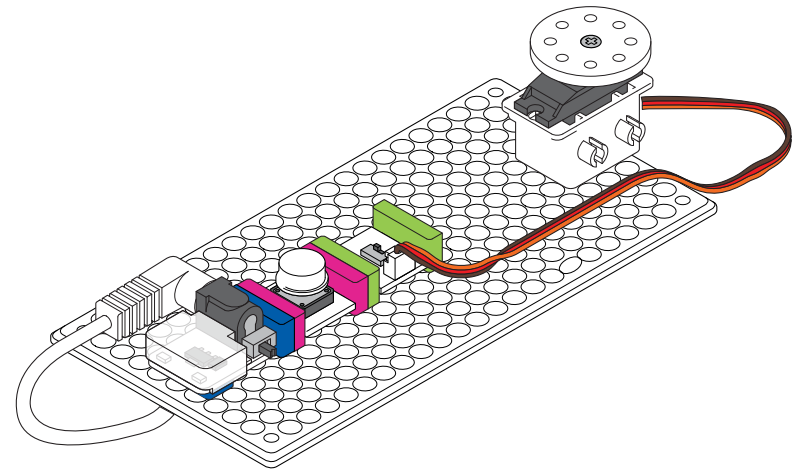
2

PRESS SERVO INTO THE SERVO BUCKET.



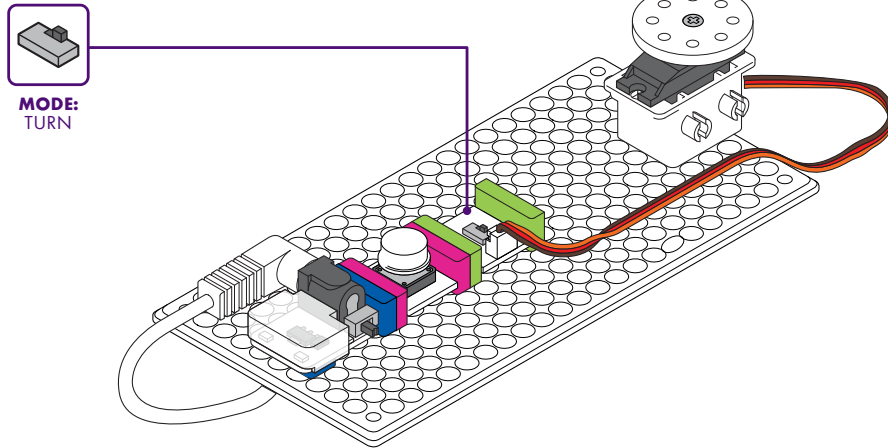
3

PRESS YOUR CIRCUIT ONTO THE MOUNTING BOARD.



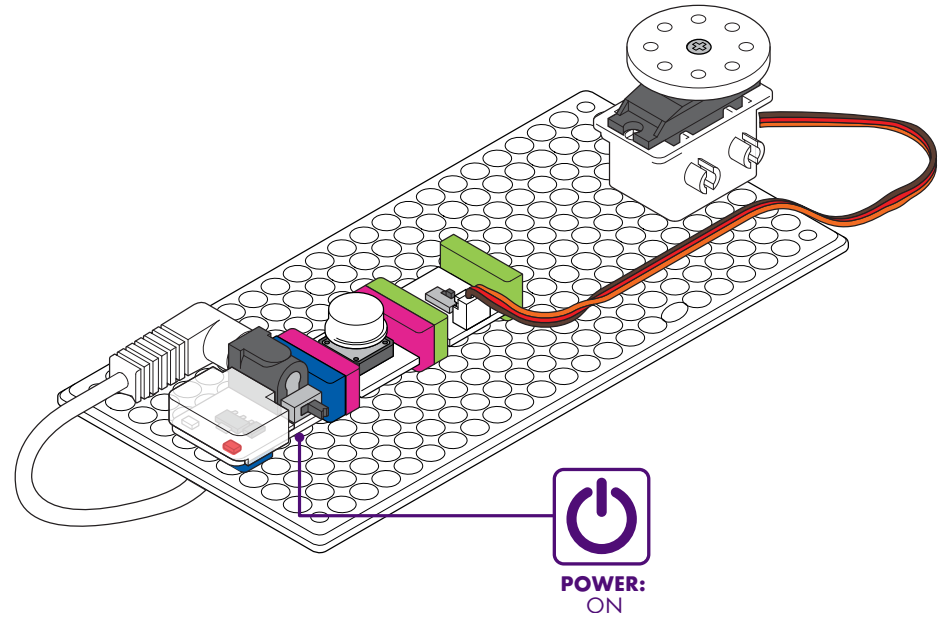
4

SET THE SERVO MODE TO "TURN".



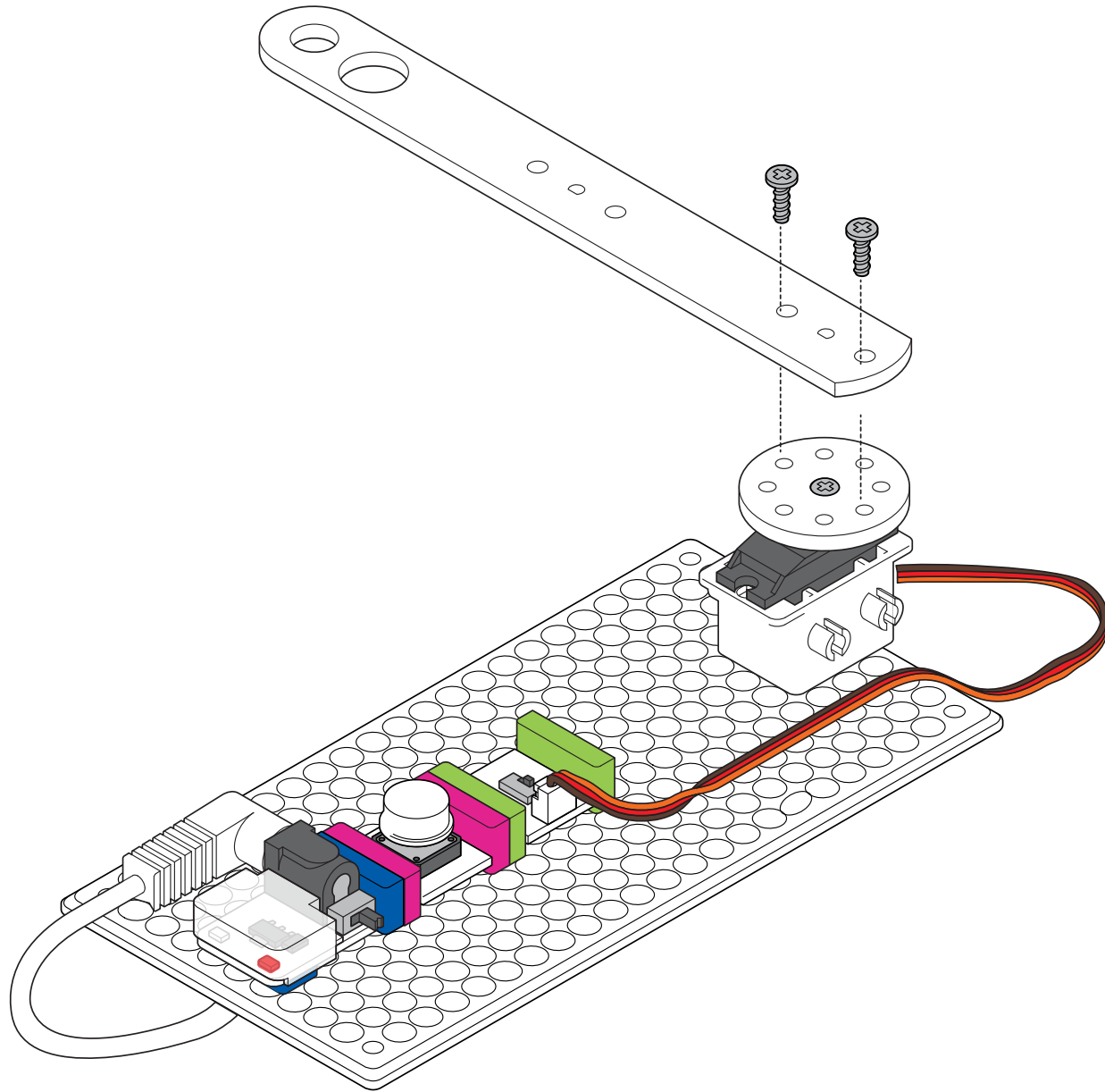
5

TURN POWER ON.

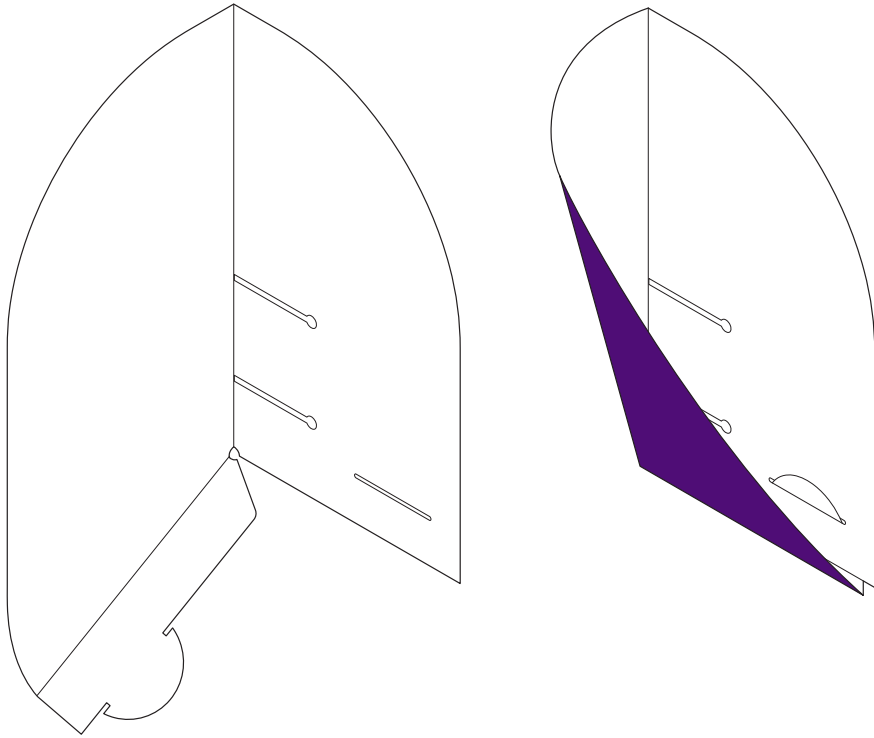


6

WITH POWER ON, CONNECT THE MECHANICAL ARM TO THE SERVO IN THIS POSITION.



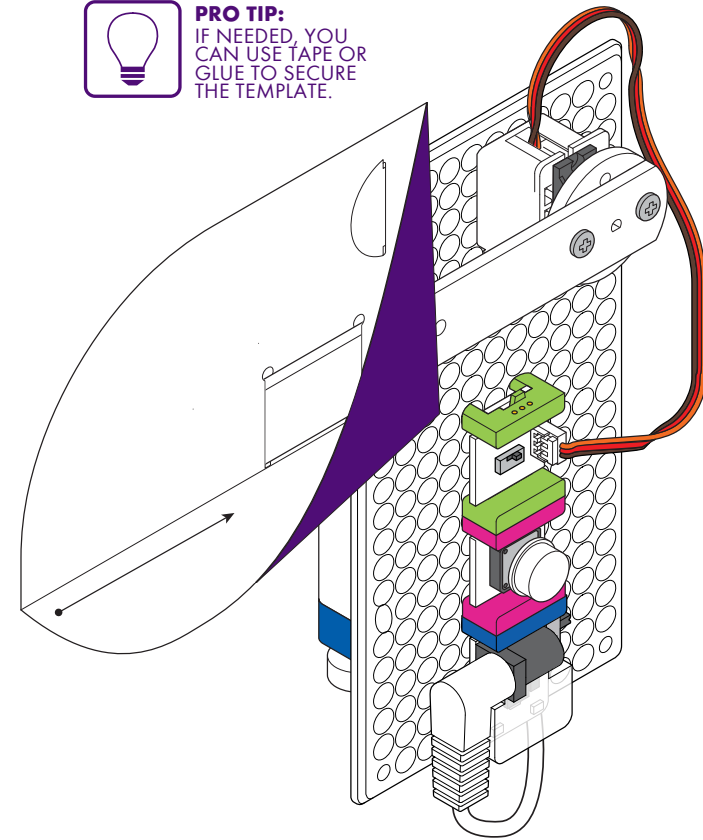
7 MAKE A BUCKET FOR THE CATAPULT.



8 ATTACH THE BUCKET TO THE FREE END OF THE MECHANICAL ARM.

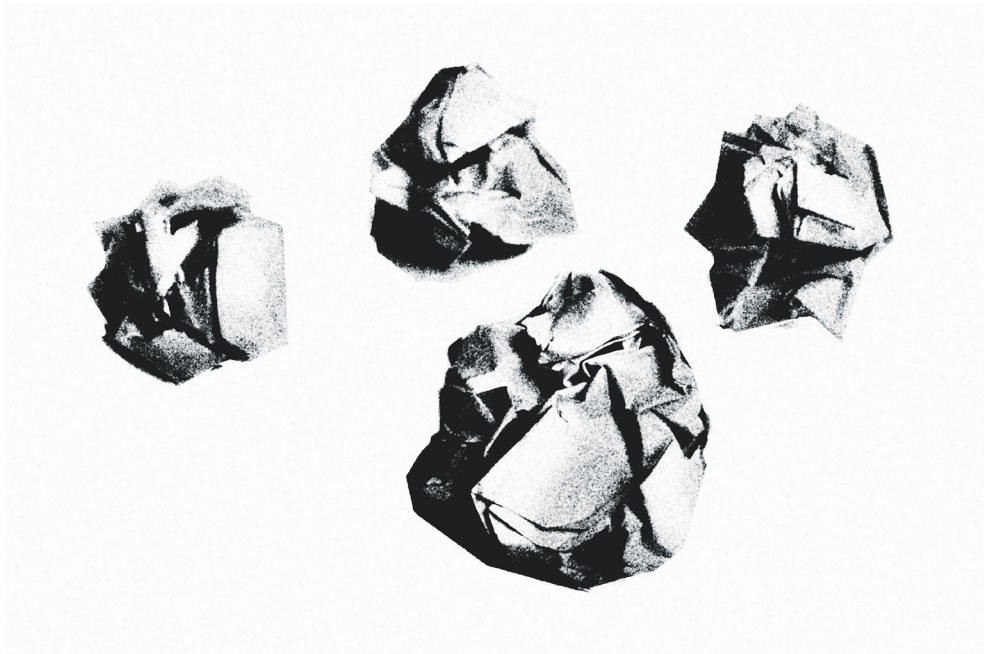


PRO TIP:
IF NEEDED, YOU
CAN USE TAPE OR
GLUE TO SECURE
THE TEMPLATE.



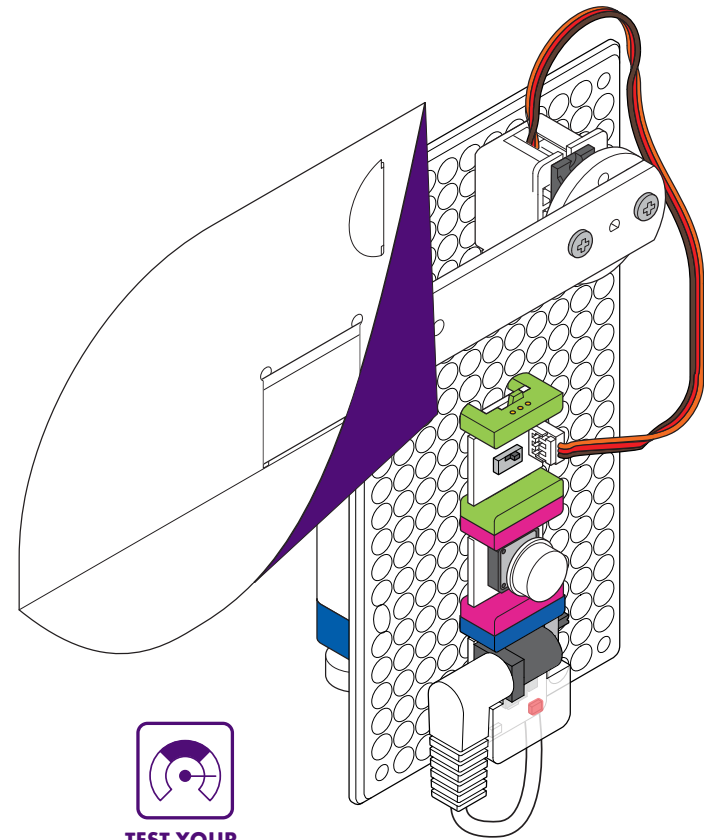
9

CRUMPLE UP A HALF SHEET OF NOTEBOOK PAPER TO LAUNCH.

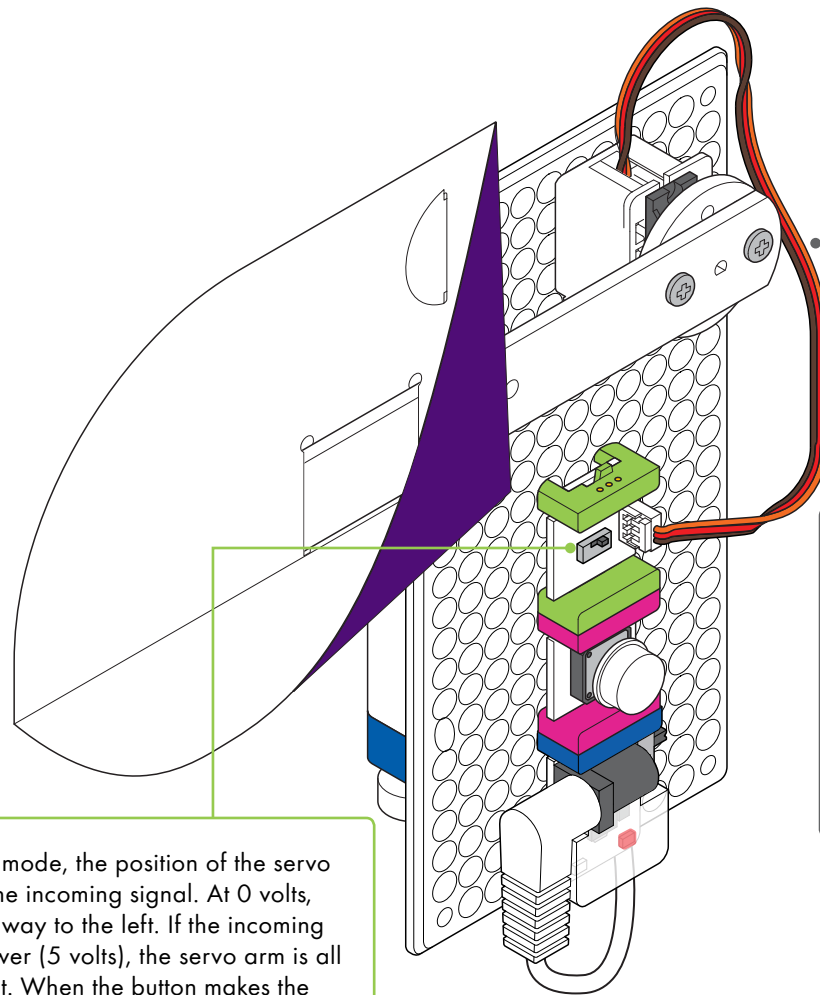


10

SWISH! Pressing the button should rotate the mechanical arm, sending the balls of paper soaring into the nearest recycling bin.



HOW IT WORKS



p4 POWER sends a signal to the button.

When pressed, the **i3 BUTTON** lets the signal through to the servo.

When the **011 SERVO** gets the signal, it turns, rotating the arm and throwing the projectile.

a23 MECHANICAL ARM

The farther you place your cup from the servo hub, the faster it will swing. You can experiment with extending the mechanical arm with other materials, but you'll have to pay attention to weight.

As the cup gets farther from the hub, it also takes more force to move it. If your arm gets too long it will overpower the servo motor and will be hard to move. This relationship between distance and force is called torque.

011 SERVO



When it's in **TURN** mode, the position of the servo is determined by the incoming signal. At 0 volts, the servo is all the way to the left. If the incoming signal is at full power (5 volts), the servo arm is all the way to the right. When the button makes the signal go from 0 to 5 volts quickly, the arm swings quickly. This speed helps your ball fly farther.