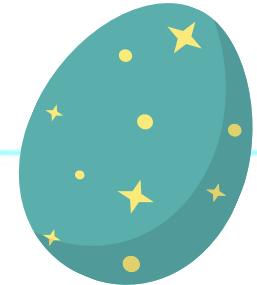
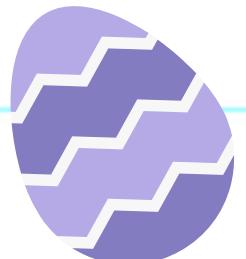


Curso: Mecatrónica – ME4250

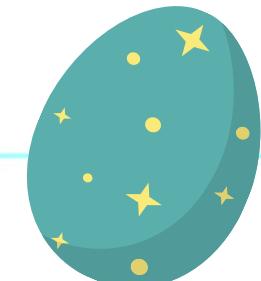
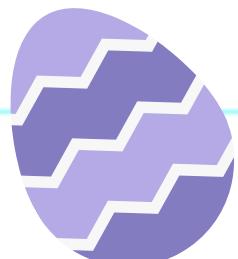
Profesor: Harold Valenzuela

Auxiliares: Francisco Cáceres – Fernando Navarrete



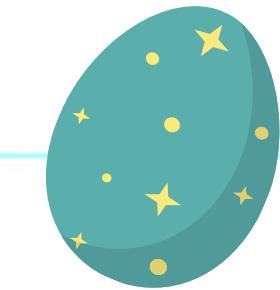
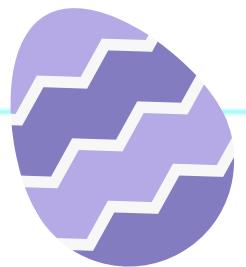
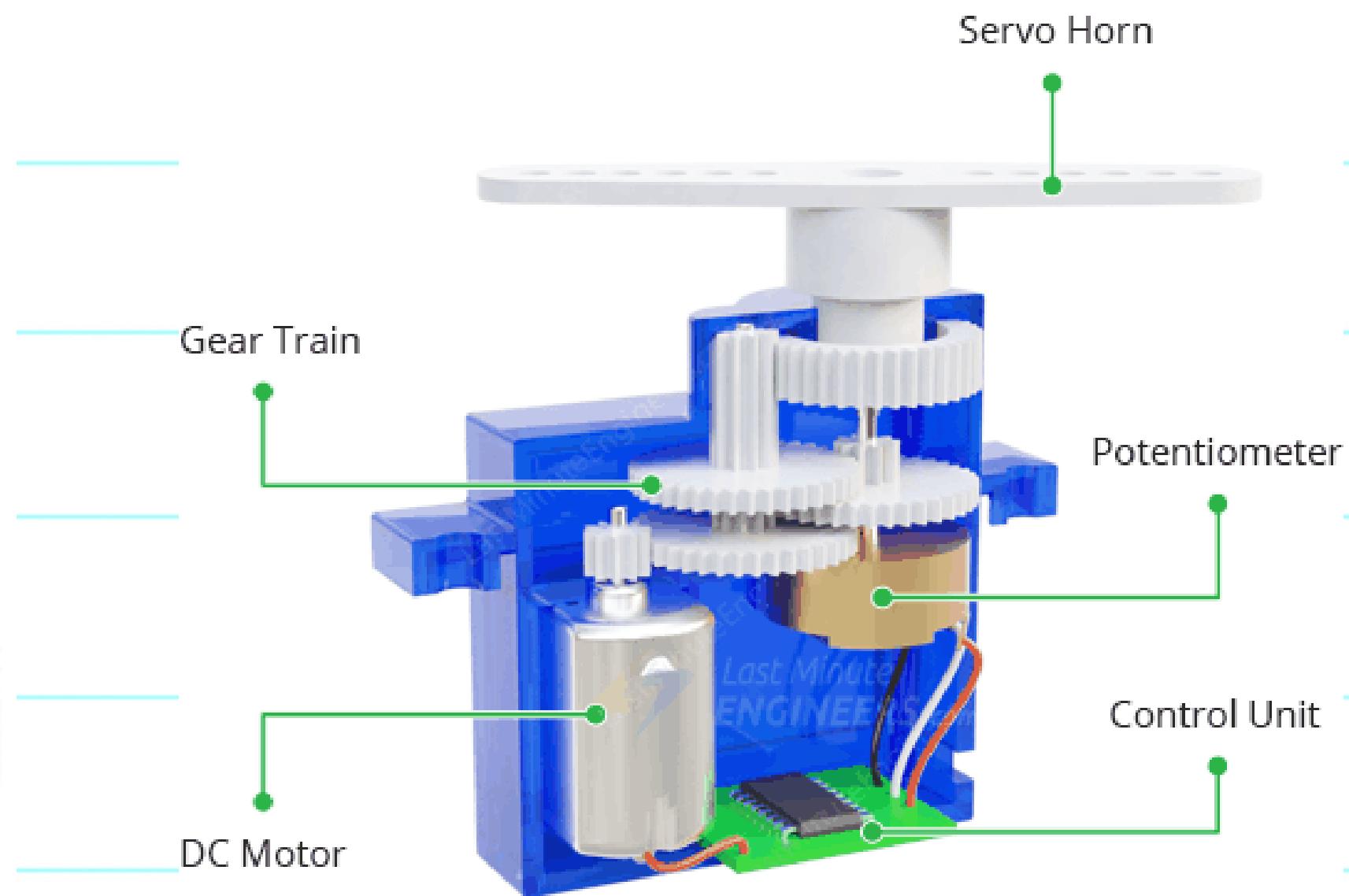
¿DÓNDE VAMOS?

Actuadores Electromecánicos	4	31-mar	1-abr	Motor Electrico	Auxiliar Motores - Puente H		Puente H y control de motores DC
	5	07-abr	8-abr	Servomotor y Motor Stepper	Desafio Motores	Desafio 1	Control de motores mediante puente H para ejecutar una rutina de movimiento
	1º Receso	14-abr	15-abr				
	6	21-abr	22-abr	Tipos Actuadores y funcionalidad	Auxiliar Servomotores y Motores PAP		Control de servomotores y motores pap con Arduino.
	7	28-abr	29-abr	Presentacion Proyecto 1	Taller Impresion 3D	Proyecto	Diseño previo y posibles motores a utilizar
	8	05-may	6-may	Intro a Sensores - Sensores de distancia, movimiento y luz	Auxiliar Sensores y Arduino		Introducción a sensores: tipos, funcionamiento y análisis de información.
Sensores	9	12-may	13-may	Sensores de aceleracion, proximidad y temperatura	Desafio Sensores	Desafio 2	Calibración del sensor para detección de objetos y control de una cinta transportadora para clasificación por color



SERVOMOTORES

SERVO COMÚN 180°

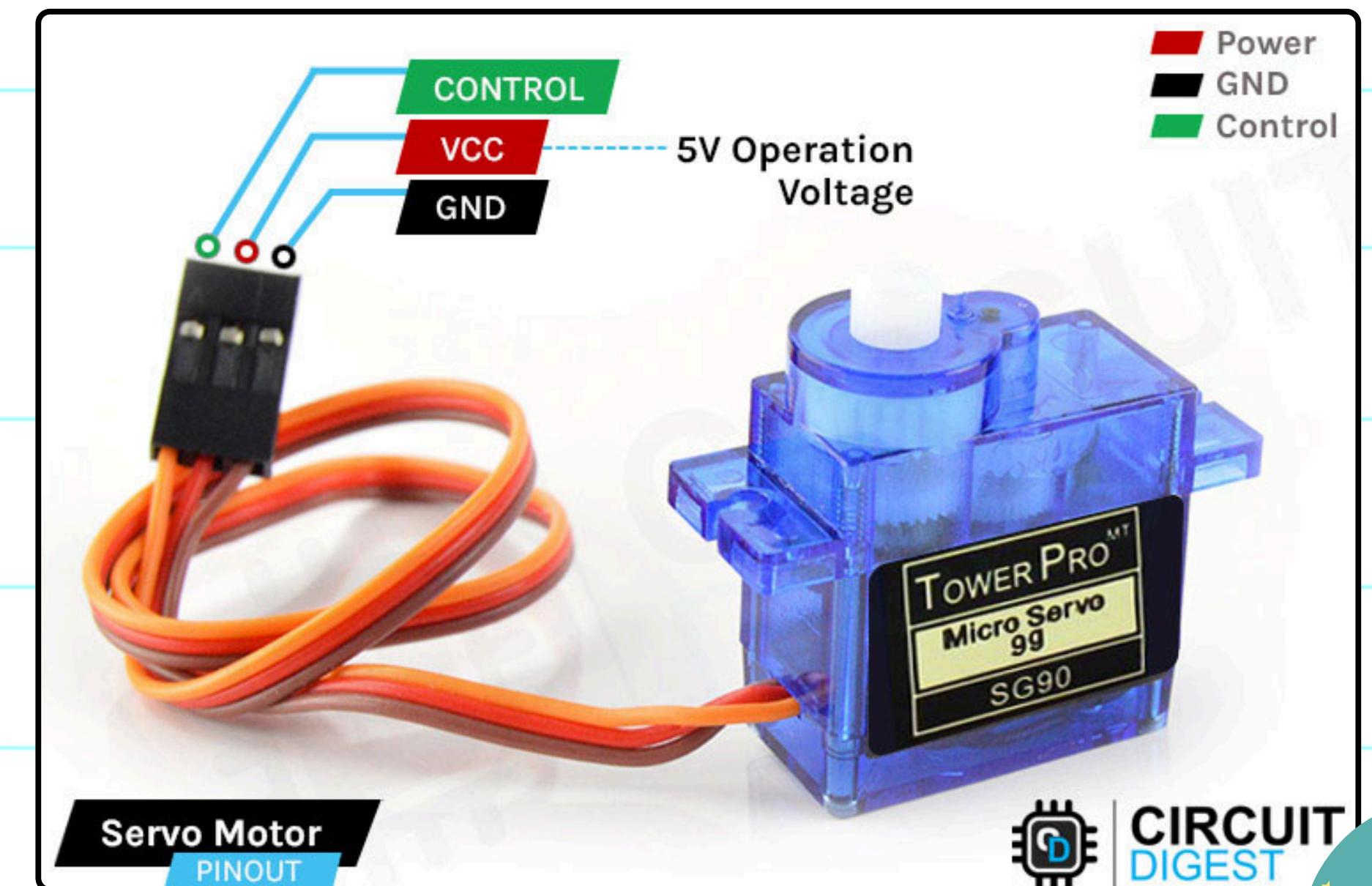


SERVOMOTORES

SERVO DE ROTACIÓN CONTINUA

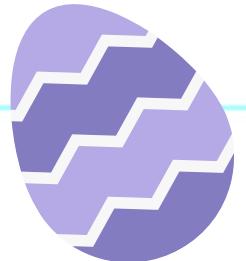
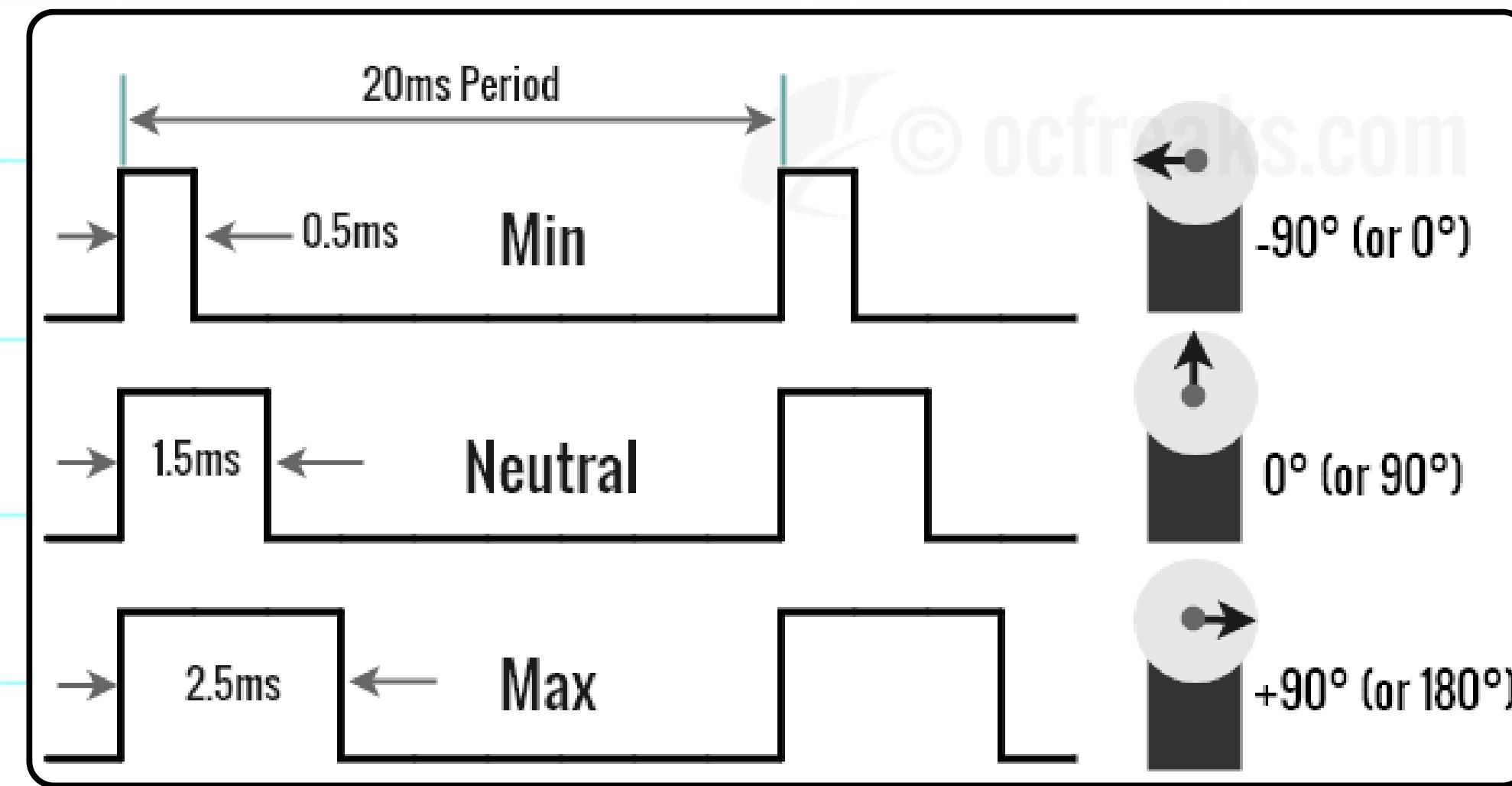


CONEXIONES

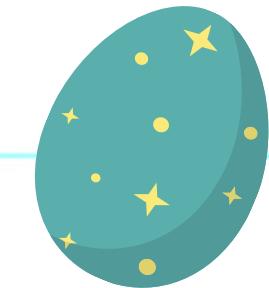


SERVOMOTORES

CONTROL CON PWM



:C

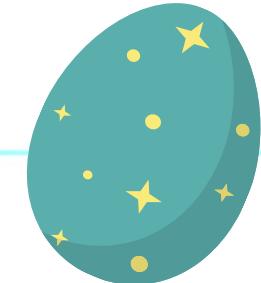


LIBRERIAS

- EXISTEN MUCHAS
- SIMPLIFICAN LA VIDA
- GENERAN FUNCIONES FÁCILES DE USAR
- SON ESPECÍFICAS

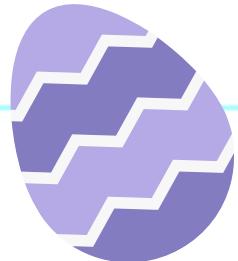


```
1 #include <PID_v1.h>
2 #include <config.h>
3 #include <coolant_control.h>
4 #include <cpu_map.h>
5 #include <defaults.h>
6 #include <eeprom.h>
7 #include <gcode.h>
8 #include <grbl.h>
9 #include <limits.h>
10 #include <motion_control.h>
11 #include <nuts_bolts.h>
12 #include <planner.h>
13 #include <print.h>
14 #include <probe.h>
15 #include <protocol.h>
16 #include <report.h>
17 #include <serial.h>
18 #include <settings.h>
19 #include <spindle_control.h>
20 #include <stepper.h>
21 #include <system.h>
22 #include <Ethernet.h>
23 #include <EEPROM.h>
24 #include <Servo.h>
```



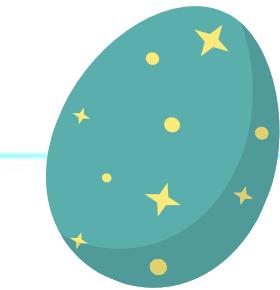
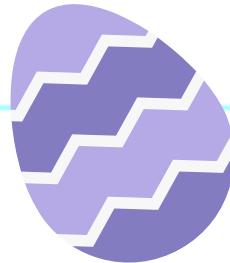
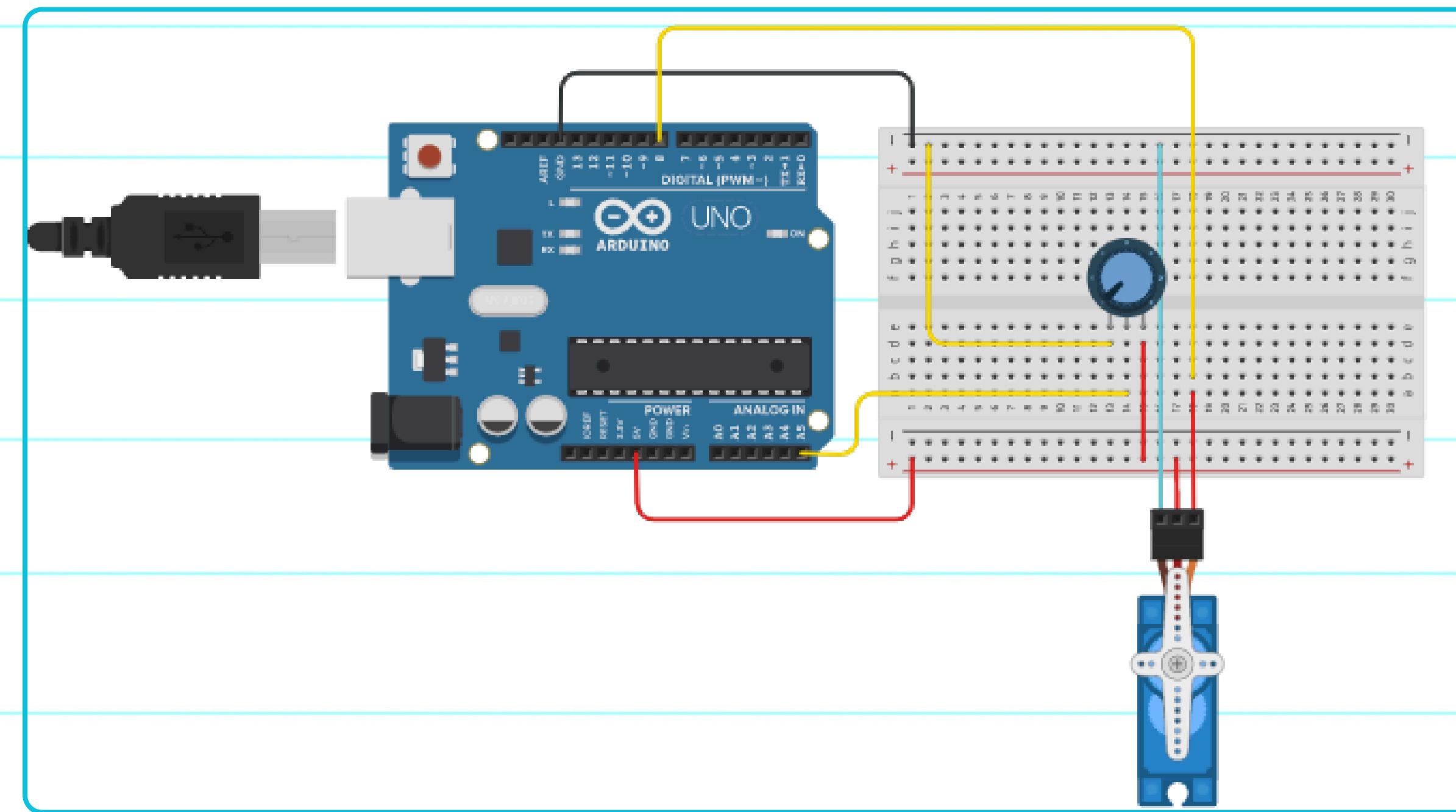
LIBRERIAS

```
1 #include <Servo.h>
2
3 Servo servito; //se inicializa el servo
4
5 void setup() {
6     servito.attach(9); //Se le asigna el pin de control (PWM)
7 }
8
9 void loop() {
10    servito.write(0); //se escribe el ángulo
11    delay(1000);
12    servito.write(90);
13    delay(1000);
14    servito.write(180);
15    delay(1000);
16 }
```



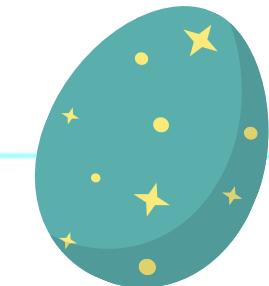
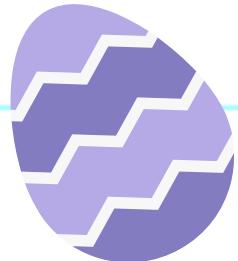
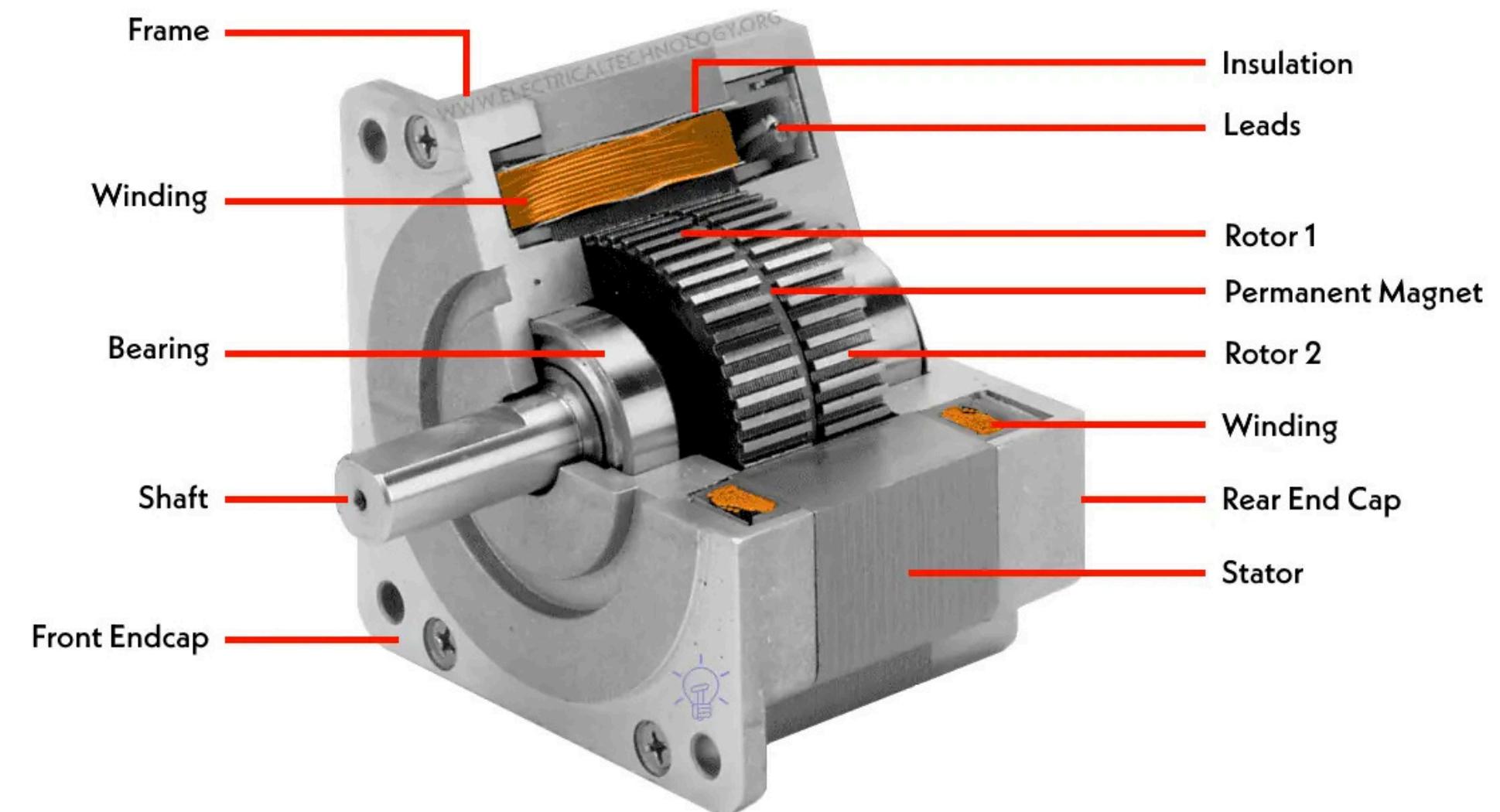
ACTIVIDAD

CONTROL CON POTENCIOMETRO

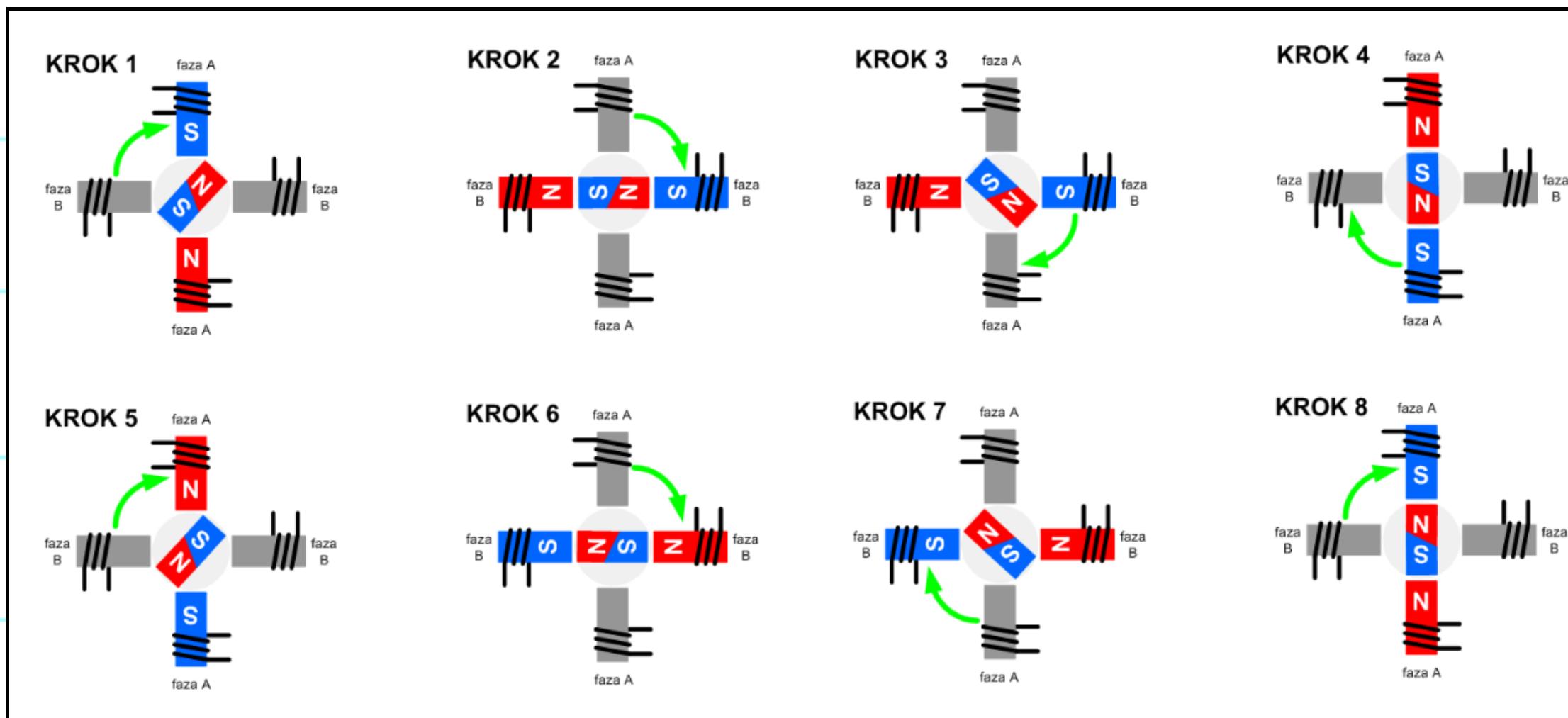


MOTORES PAP

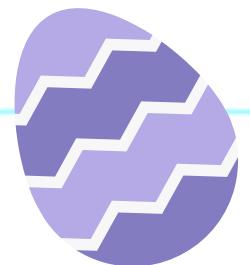
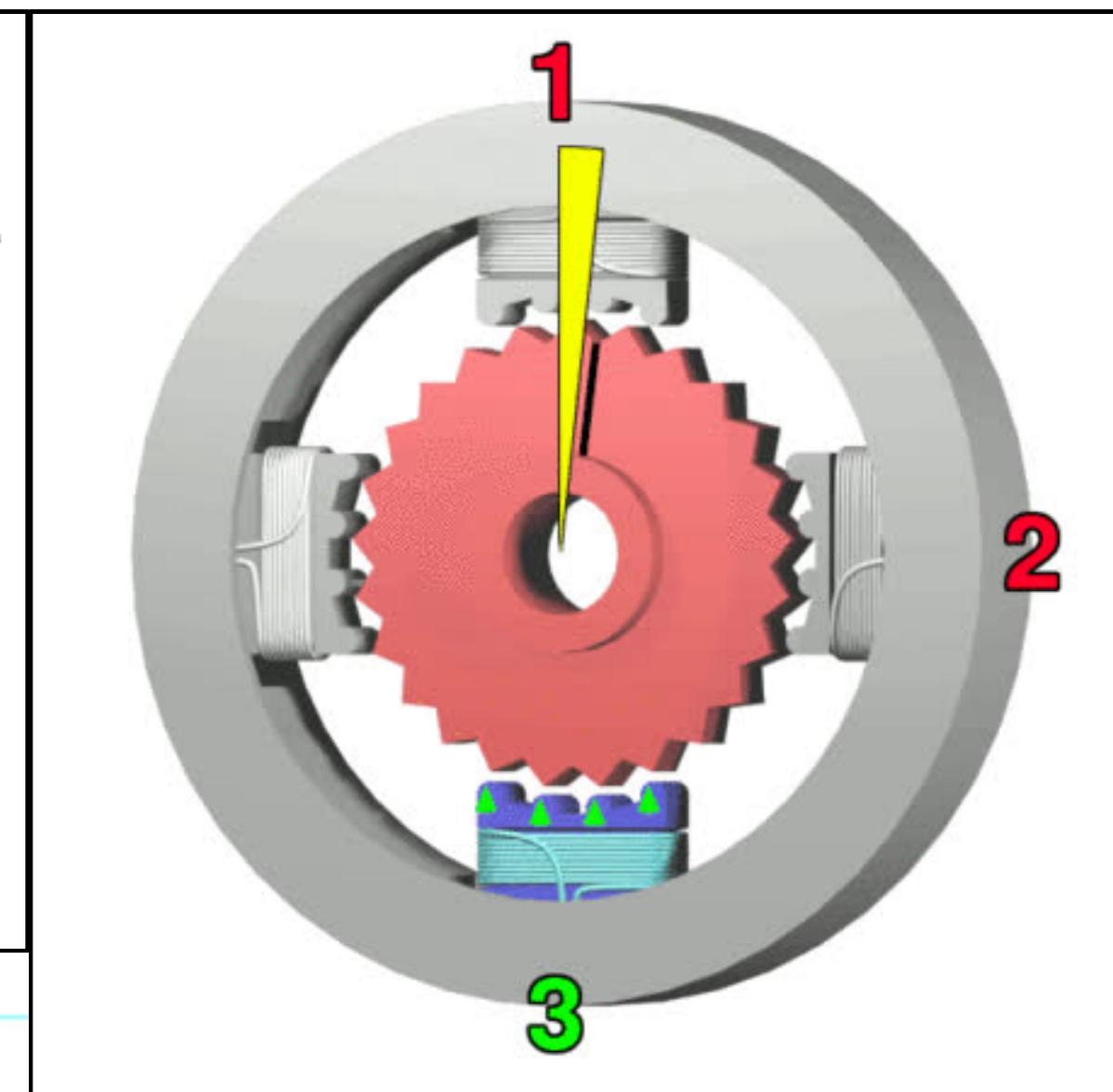
(PASO A PASO Ó STEPPER)



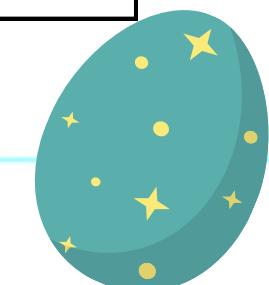
MOTORES PAP: FUNCIÓN



360°

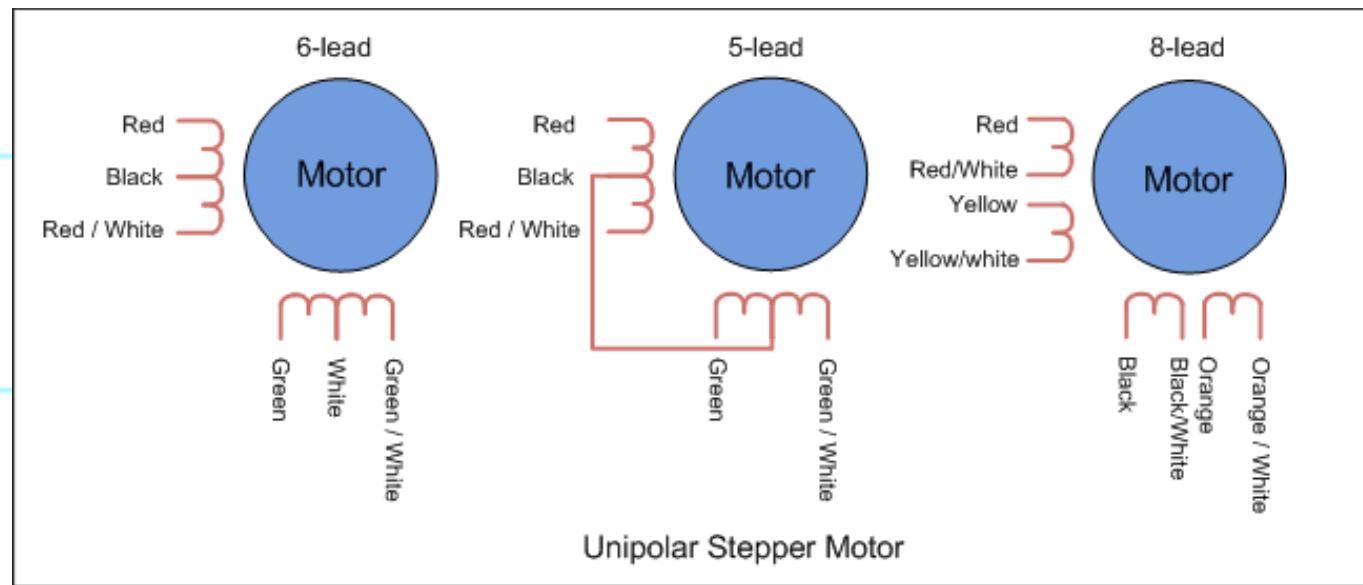


$$\theta_{paso} = \frac{360^\circ}{N \text{ de pasos por vuelta}}$$

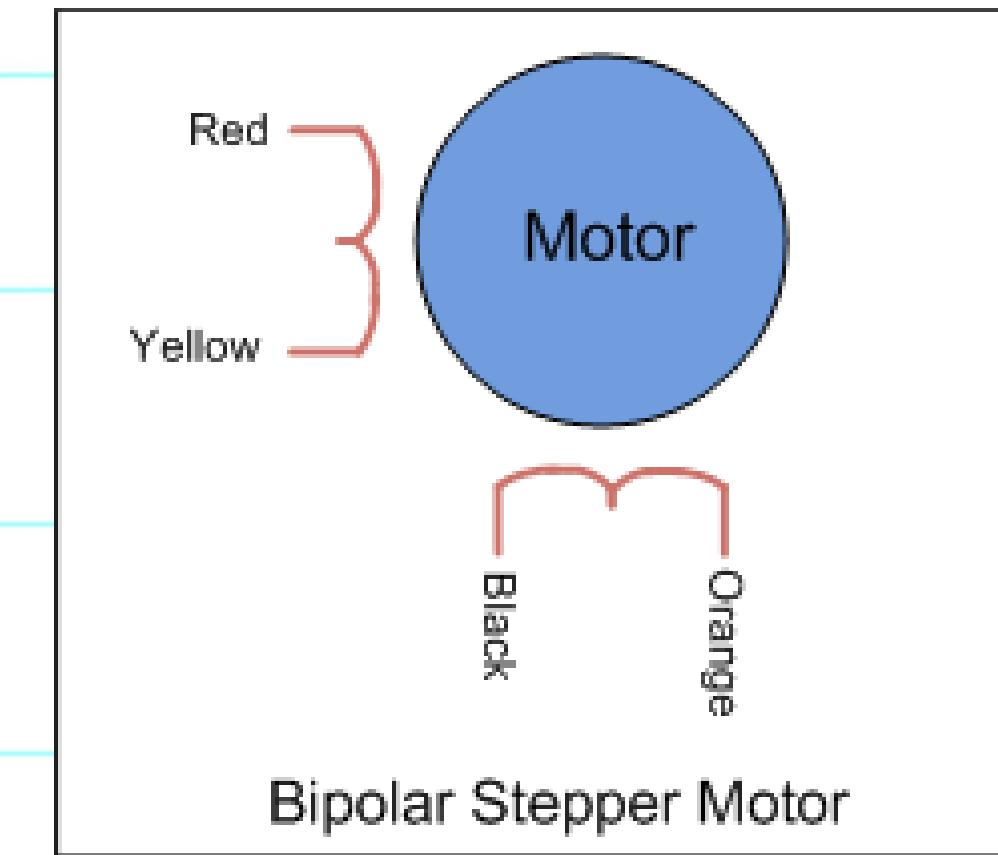


MOTORES PAP

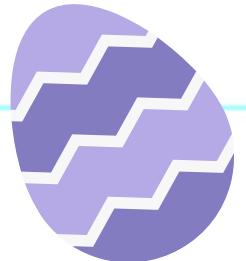
UNIPOLARES



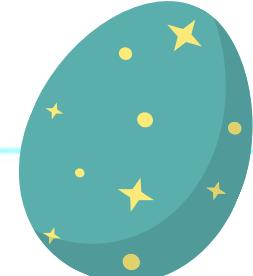
BIPOLARES



CORRIENTE CIRCULA EN 1 DIRECCIÓN ALTERNADAMENTE
(2 FASES)

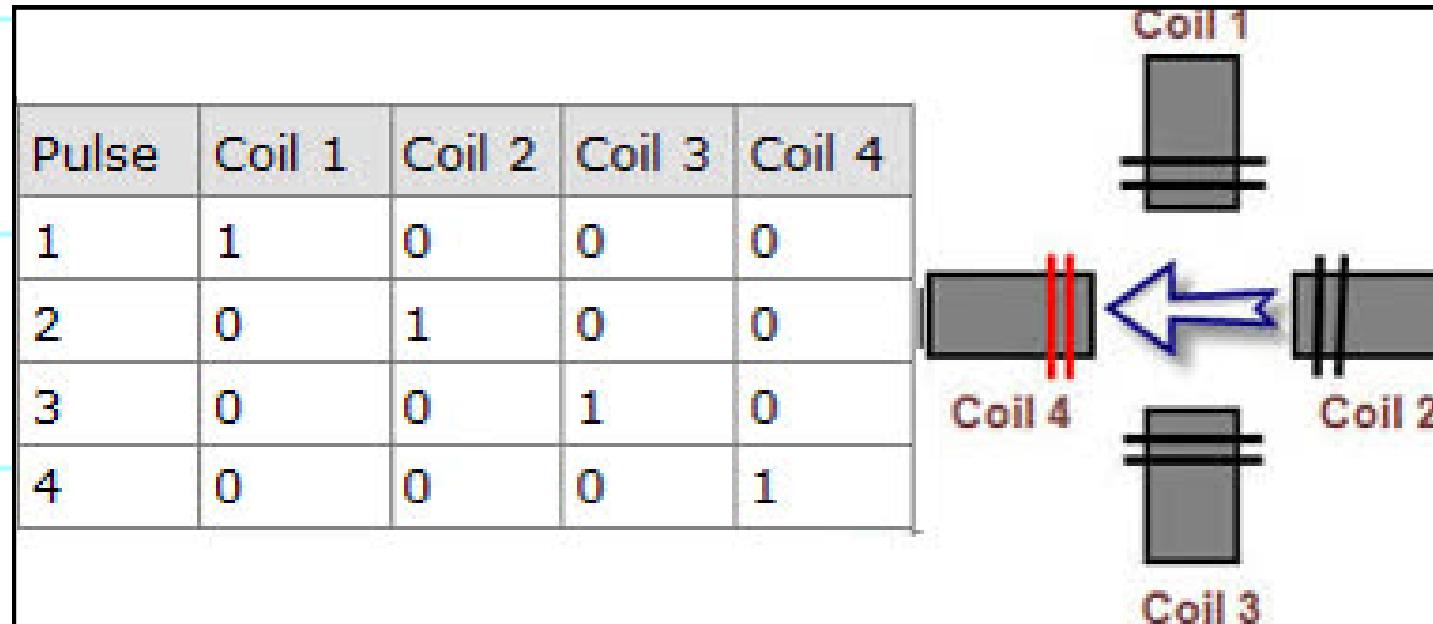


CORRIENTE INVIERTE DIRECCIÓN EN CADA FASE
(4 FASES)



MOTORES PAP

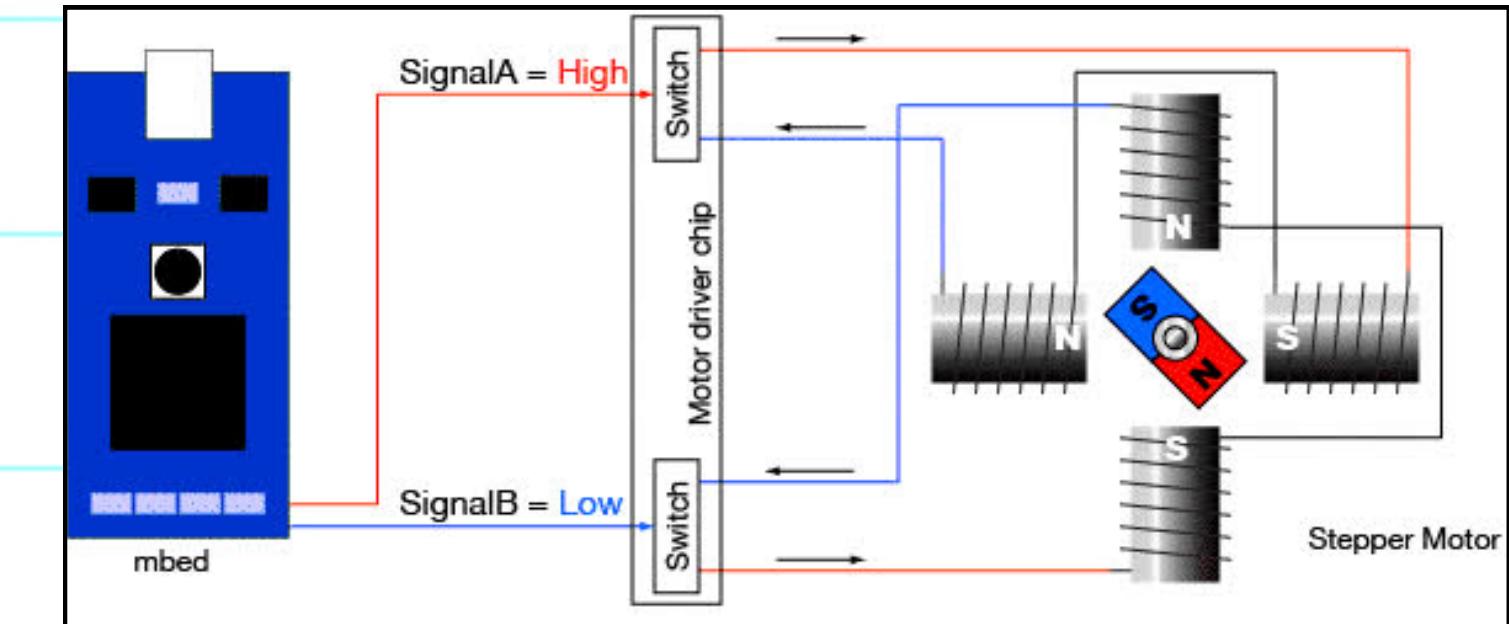
UNIPOLARES



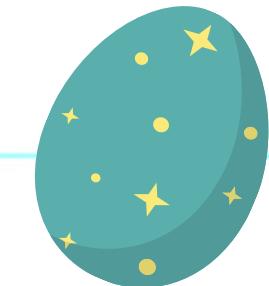
CORRIENTE CIRCULA EN 1 DIRECCIÓN ALTERNADAMENTE
(2 FASES)



BIPOLARES



CORRIENTE INVIERTE DIRECCIÓN EN CADA FASE
(4 FASES)



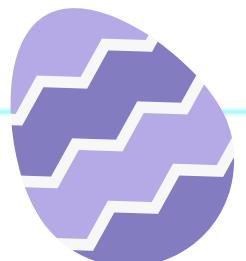
MOTORES PAP: EJEMPLOS



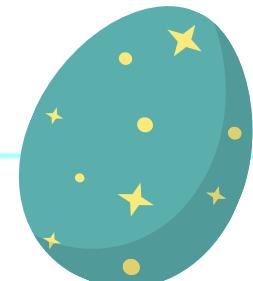
NEMA 17

ESPECIFICACIONES:

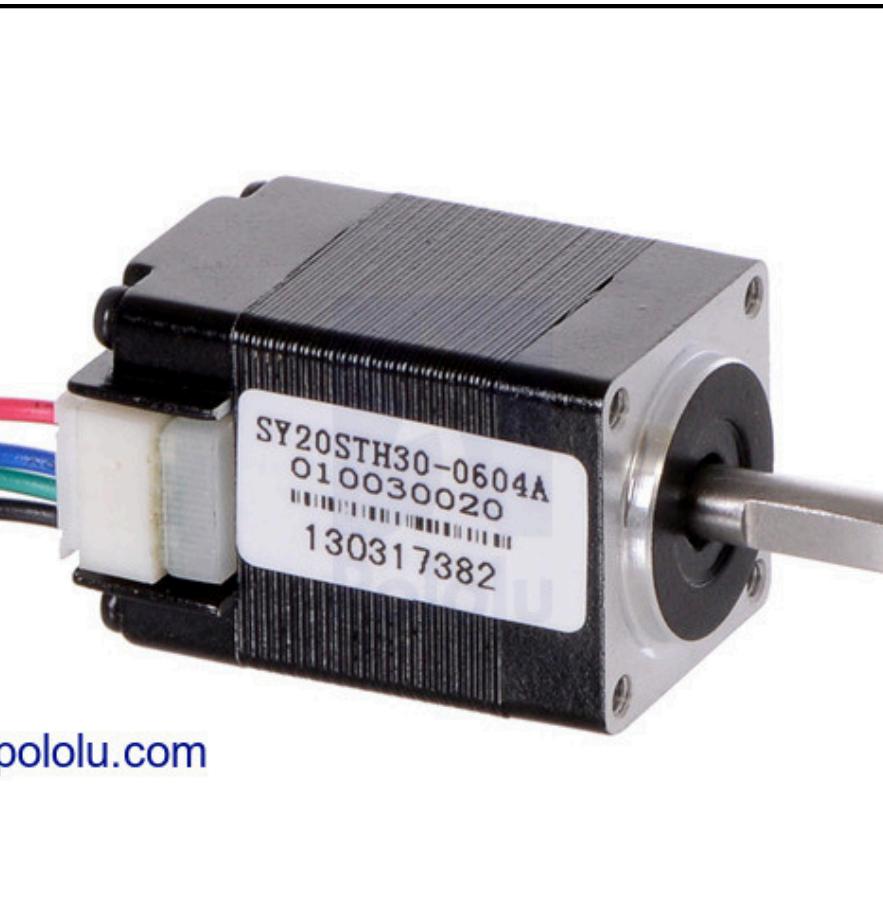
- DIMENSIONES: 1.7"X1.7" CARA FRONTAL
- VOLTAJE/CORRIENTE: 3.06V / 1.7A
- BIPOLEAR / N° CABLES = 4
- TORQUE: 56 N.CM
- ÁNGULO DE PASO: 1.8°



¡1 REVOLUCIÓN = 200 PASOS!



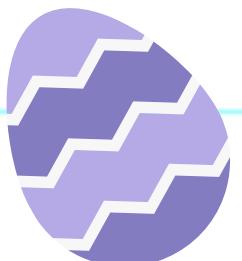
MOTORES PAP: EJEMPLOS



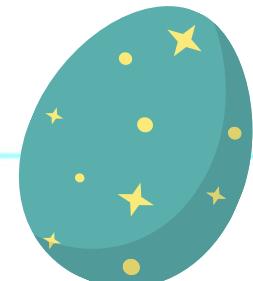
NEMA 8

ESPECIFICACIONES:

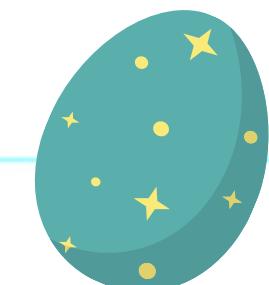
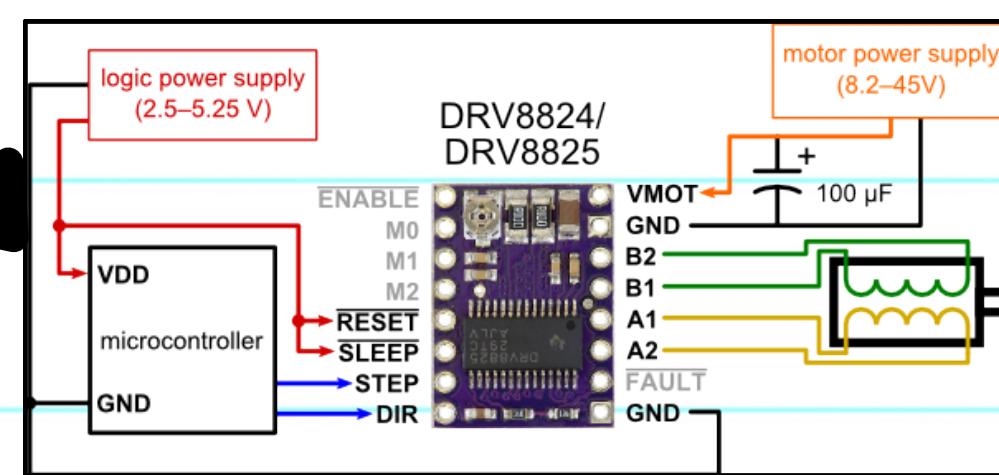
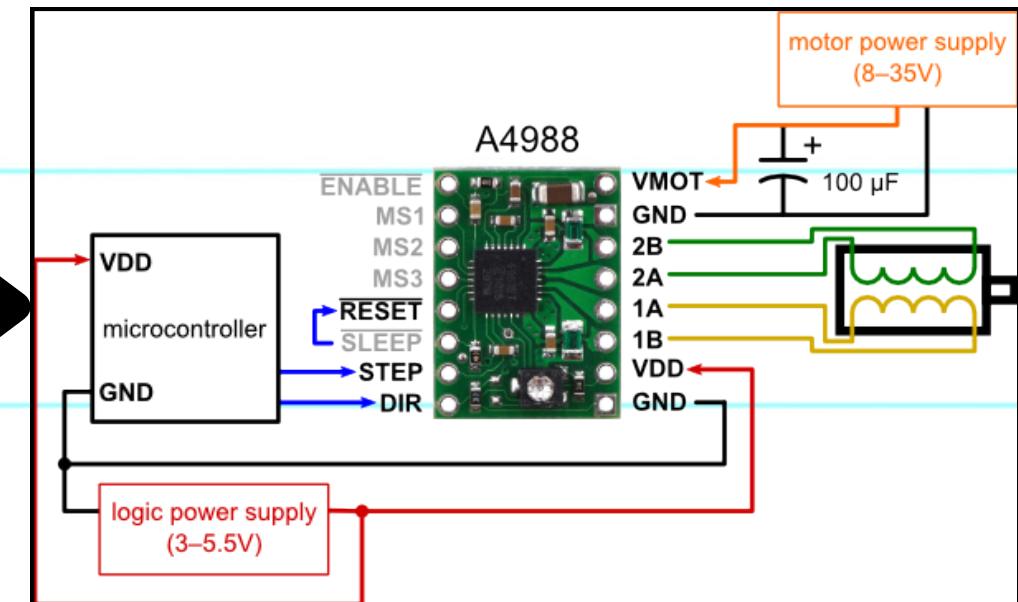
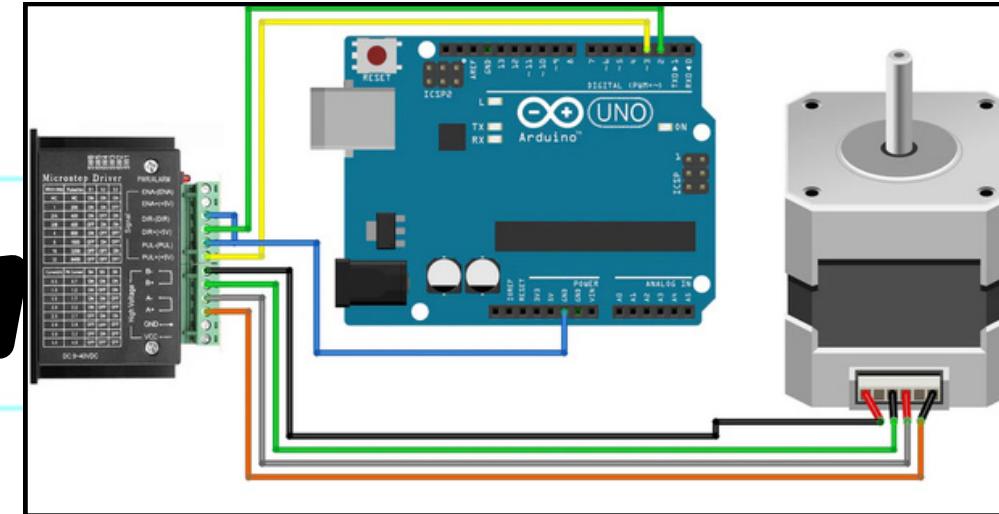
- DIMENSIONES: 8"X8" CARA FRONTAL
- VOLTAJE/CORRIENTE: 3.9V / 0.6A
- BIPOLEAR / N° CABLES = 4
- TORQUE: 1.76 N.CM (0.18 G.CM)
- ÁNGULO DE PASO: 1.8°



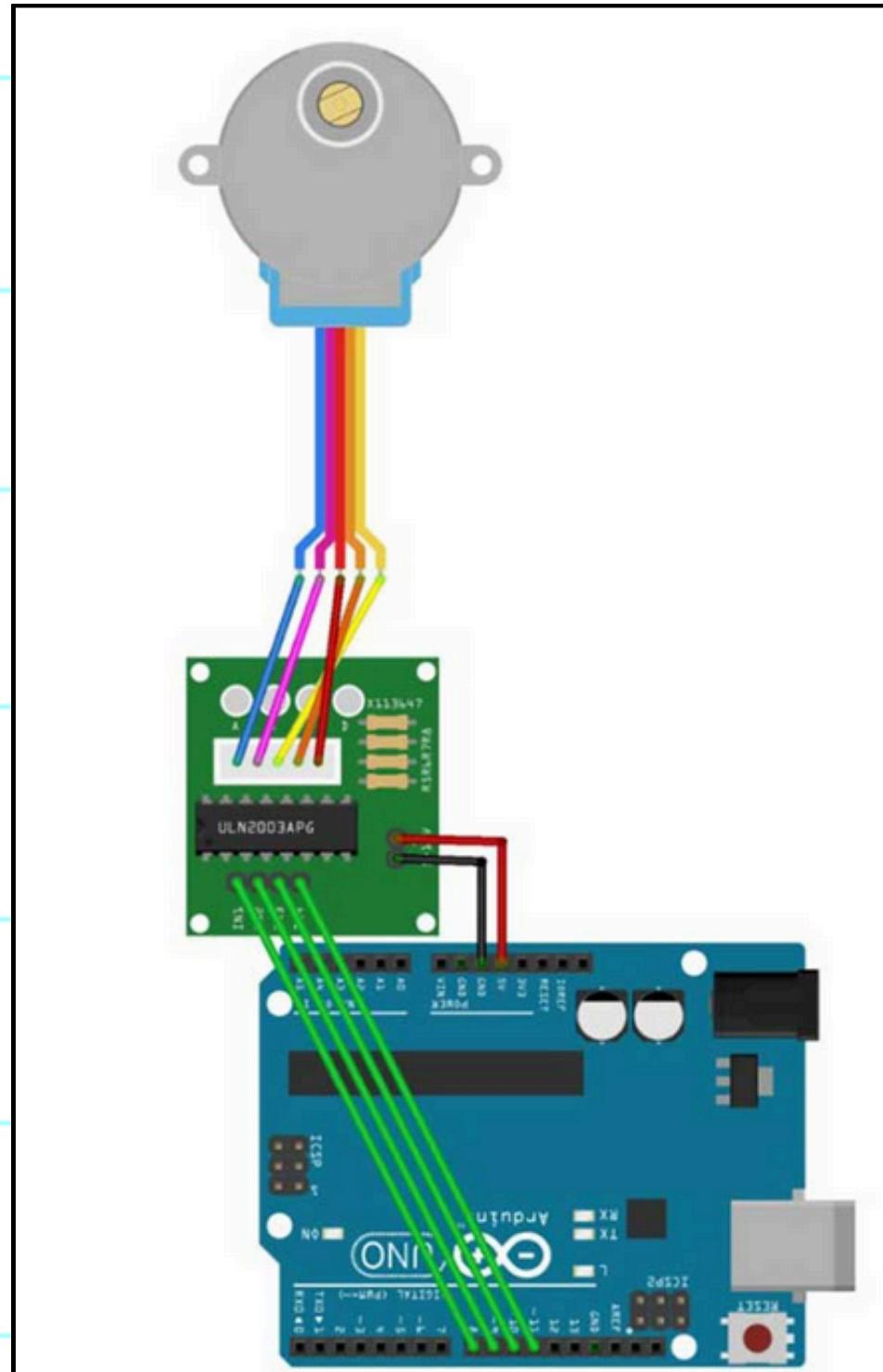
¡1 REVOLUCIÓN = 200 PASOS!



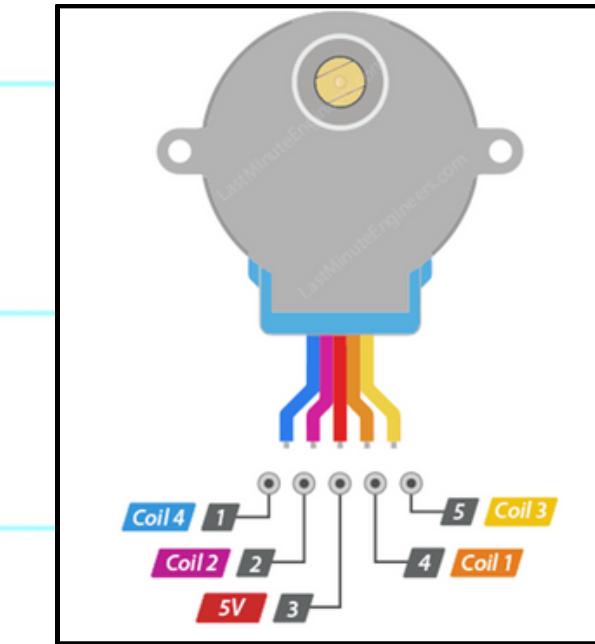
MOTORES PAP: DRIVERS



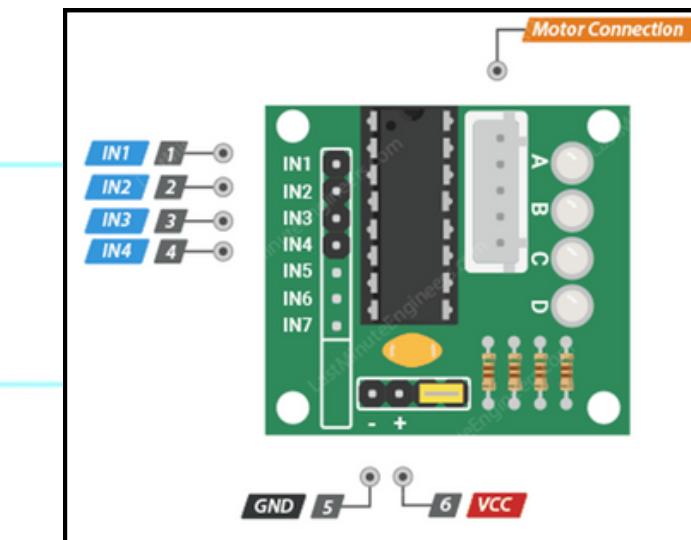
MOTORES PAP: PRÁCTICA



LINK



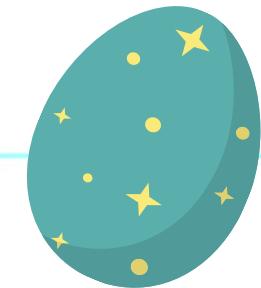
STEPPER: 28BYJ-48



DRIVER: ULN2003

-UNIPOLAR
-ÁNGULO X PASO: 11.25°
-REDUCCIÓN: 1/64
-PASOS X REV: 2048

-VOLTAJE: 5-12 V
-RESISTENCIAS Y LEDS
DE APOYO



¡ GRACIAS !

