SPIKE™ Prime de LEGO® Education

Programas Python
Posibles soluciones

SPIKE™ Prime de LEGO® Education

¡Ayuda!

https://education.lego.com/es-es/lessons/prime-invention-squad/help

```
from spike import PrimeHub, App, ColorSensor
from spike.control import wait_for_seconds

hub = PrimeHub()
app = App()
color_sensor = ColorSensor('B')

# Esta es la historia n.º 1: Kiki está paseando. Está feliz de salir a tomar el aire, pero de repente...
hub.left_button.wait_until_pressed()

color_sensor.wait_until_color('blue')
app.play_sound('Traffic')

color_sensor.wait_until_color('yellow')
app.play_sound('Ring Tone')

color_sensor.wait_until_color('green')
app.play_sound('Dog Bark 1')
app.play_sound('Dog Bark 1')

# Esta es la historia n.º 2:
hub.right_button.wait_until_pressed()

color_sensor.wait_until_color('blue')
app.play_sound('Door Knock')

color_sensor.wait_until_color('yellow')
app.play_sound('Glass Breaking')

color_sensor.wait_until_color('green')
app.play_sound('Dog Bark 3')
```

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Carrera de saltadores

https://education.lego.com/es-es/lessons/prime-invention-squad/hopper-race

```
from spike import PrimeHub, MotorPair
from spike.control import wait_for_seconds


hub = PrimeHub()
hop_motors = MotorPair('E', 'F')


hop_motors.set_default_speed(50)


hub.light_matrix.write('3')
wait_for_seconds(1)

hub.light_matrix.write('2')
wait_for_seconds(1)

hub.light_matrix.write('1')
wait_for_seconds(1)

# Ajústalo para cambiar la distancia que recorrerá tu saltador.
# --------------v
hop_motors.move(10, 'seconds')
```

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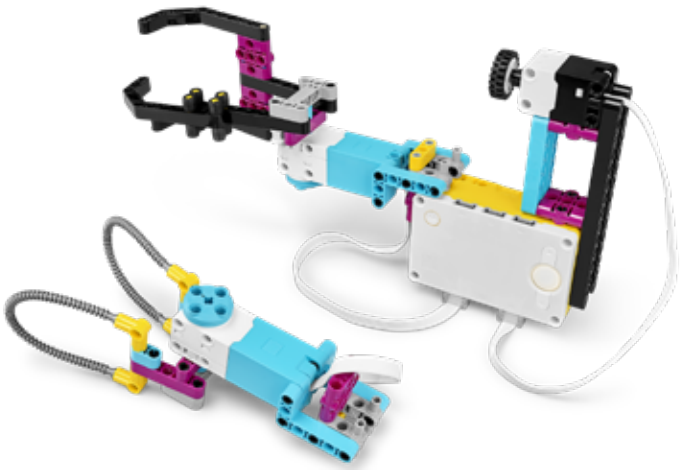
Superlimpieza

https://education.lego.com/es-es/lessons/prime-invention-squad/super-cleanup



```
from spike import ForceSensor, Motor


force_sensor = ForceSensor('E')
grabber_motor = Motor('A')


while True:
    force_sensor.wait_until_pressed()
    grabber_motor.set_stall_detection(False)
    grabber_motor.start(-75)

    force_sensor.wait_until_released()
    grabber_motor.set_stall_detection(True)
    grabber_motor.start(75)
```

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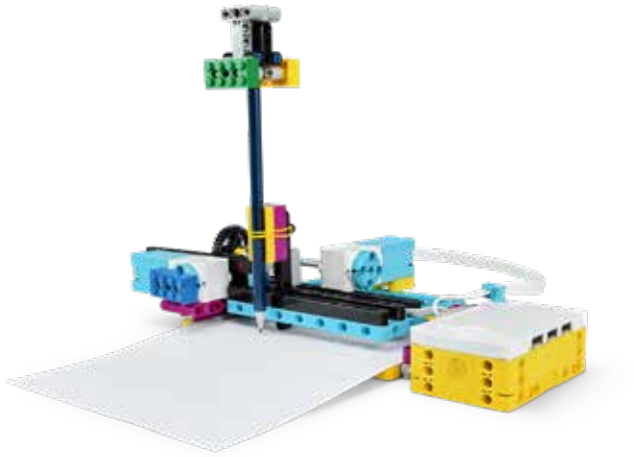
Roto

https://education.lego.com/es-es/lessons/prime-invention-squad/broken



```
from spike import PrimeHub, Motor
from spike.control import wait_for_seconds
hub = PrimeHub()
x_motor = Motor('A')
y_motor = Motor('C')

hub.left_button.wait_until_pressed()
x_motor.set_default_speed(-100)
x_motor.run_for_seconds(1.5)
wait_for_seconds(1)

# Estas líneas deberían «cortar» un cuadrado.
x_motor.set_default_speed(100)
y_motor.set_default_speed(100)
x_motor.run_for_degrees(400)
y_motor.run_for_degrees(575)
x_motor.run_for_degrees(-400)
y_motor.run_for_degrees(-575)

hub.right_button.wait_until_pressed()
x_motor.set_default_speed(100)
x_motor.run_for_seconds(1.5)

wait_for_seconds(1)
# Estas líneas deberían «cortar» un rectángulo.
x_motor.run_for_degrees(-60)
x_motor.run_for_degrees(-400)
y_motor.run_for_degrees(-800)
x_motor.run_for_degrees(400)
y_motor.run_for_degrees(800)
```

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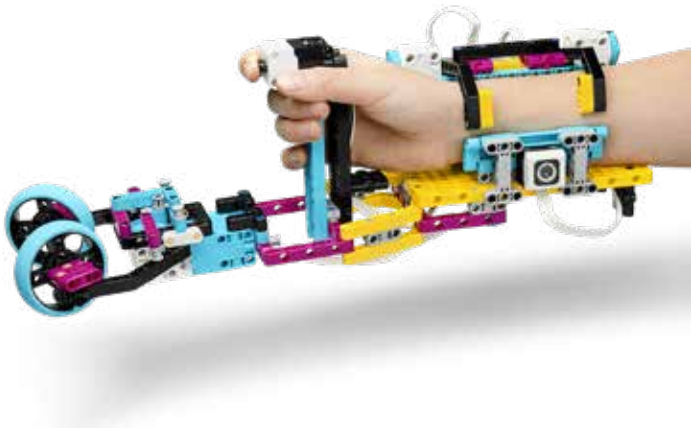
Diseñar para alguien

https://education.lego.com/es-es/lessons/prime-invention-squad/design-for-someone



```
from spike import PrimeHub, Motor, ForceSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
motor_a = Motor('A')
motor_e = Motor('E')
force_sensor = ForceSensor('B')


motor_a.set_default_speed(100)
motor_e.set_default_speed(-100)
motor_a.set_stall_detection(False)
motor_e.set_stall_detection(False)
motor_a.set_stop_action('hold')
motor_e.set_stop_action('hold')


motor_a.run_to_position(0)
hub.speaker.beep(60)
hub.speaker.beep(72)

# Haz que la prótesis se agarre al brazo de alguien
motor_a.run_for_seconds(1)
motor_e.run_for_seconds(1)

while True:
    if hub.right_button.was_pressed():
        # Haz que la prótesis se suelte
        motor_a.run_to_position(0)
        motor_e.run_to_position(0)
        break

    if force_sensor.get_force_newton() > 5:
        hub.light_matrix.show_image('SQUARE')
    else:
        hub.light_matrix.off()

    wait_for_seconds(0.01)
```

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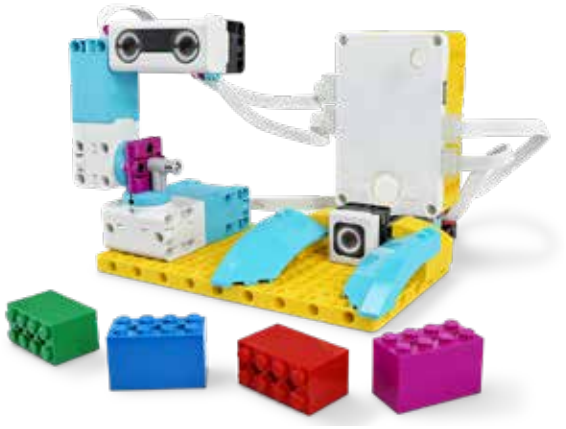
Haz tu pedido

https://education.lego.com/es-es/lessons/prime-kickstart-a-business/place-your-order



```
from spike import PrimeHub, App, ColorSensor, DistanceSensor, Motor
from spike.control import wait_for_seconds


hub = PrimeHub()
app = App()
distance_sensor = DistanceSensor('C')
color_sensor = ColorSensor('D')
arm_motor = Motor('A')
base_motor = Motor('F')


arm_motor.set_default_speed(50)
base_motor.set_default_speed(50)


arm_motor.run_to_position(350)
base_motor.run_to_position(350)

app.start_sound('Connect')
distance_sensor.light_up_all()

for x in range(10):
    hub.light_matrix.show_image('HEART')
    wait_for_seconds(0.5)
    hub.light_matrix.show_image('HEART_SMALL')
    wait_for_seconds(0.5)

hub.light_matrix.show_image('HEART')

while True:
    color_sensor.wait_until_color('violet')
    arm_motor.run_for_degrees(30)
    arm_motor.run_for_degrees(-60)
    arm_motor.run_for_degrees(60)
    arm_motor.run_for_degrees(-30)
    app.start_sound('Connect')
    hub.light_matrix.show_image('HEART')
```

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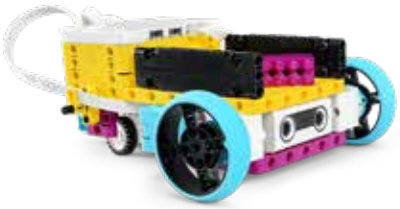
Fuera de servicio

https://education.lego.com/es-es/lessons/prime-kickstart-a-business/out-of-order

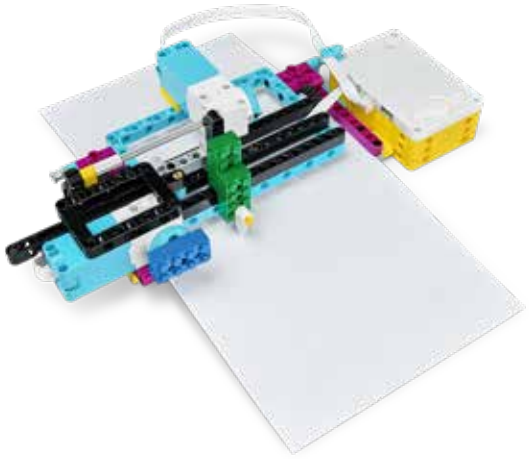


```
from spike import PrimeHub, DistanceSensor, Motor, MotorPair
from spike.control import wait_for_seconds

hub = PrimeHub()
distance_sensor = DistanceSensor('B')
drive_motors = MotorPair('A', 'E')
small_wheel_motor = Motor('C')


small_wheel_motor.set_default_speed(100)
drive_motors.set_default_speed(50)

hub.left_button.wait_until_pressed()
# Aquí tienes una forma de depurar el primer programa.
small_wheel_motor.run_to_position(0)
drive_motors.start()
# Ajusta el valor aquí ----------------------v
distance_sensor.wait_for_distance_closer_than(15, DistanceSensor.CM)
drive_motors.stop()



hub.right_button.wait_until_pressed()
# Aquí tienes una forma de depurar el segundo programa.
small_wheel_motor.run_to_position(0)
drive_motors.start()
# Ajusta el valor aquí ----------------------v
distance_sensor.wait_for_distance_closer_than(15, DistanceSensor.CM)
drive_motors.stop()
# Ajusta el valor aquí ----------v
small_wheel_motor.run_to_position(20)
wait_for_seconds(1)
drive_motors.move(-50, DistanceSensor.CM)
drive_motors.stop()
small_wheel_motor.run_to_position(0)
wait_for_seconds(1)
# Ajusta el valor aquí.
# ----------------v
drive_motors.move(50, DistanceSensor.CM)
drive_motors.stop()
```

SPIKE™ Prime de LEGO® Education

Hacer un seguimiento de los paquetes

https://education.lego.com/es-es/lessons/prime-kickstart-a-business/track-your-packages



```
from spike import PrimeHub, Motor
from spike.control import wait_for_seconds

hub = PrimeHub()
horizontal_motor = Motor('A')
vertical_motor = Motor('C')

horizontal_motor.set_default_speed(75)
vertical_motor.set_default_speed(75)


# Este programa hará un seguimiento del paquete en el mapa n.º 1

hub.left_button.wait_until_pressed()
horizontal_motor.run_for_seconds(1)
wait_for_seconds(1)

vertical_motor.run_for_degrees(475)
horizontal_motor.run_for_degrees(-545)
vertical_motor.run_for_degrees(950)
horizontal_motor.run_for_degrees(550)
vertical_motor.run_for_degrees(380)

# Haz funcionar ambos motores al mismo tiempo para moverte en diagonal
vertical_motor.start(speed=75)
horizontal_motor.run_for_degrees(-540, speed=50)
vertical_motor.stop()

vertical_motor.run_for_degrees(175)
```

SPIKE™ Prime de LEGO® Education

Un lugar seguro

https://education.lego.com/es-es/lessons/prime-kickstart-a-business/keep-it-safe

```
from spike import PrimeHub, Motor, LightMatrix
from spike.control import wait_for_seconds, wait_until
from spike.operator import greater_than

hub = PrimeHub()
lock_motor = Motor('C')
dial_motor = Motor('B')
lock_motor.set_default_speed(50)

hub.speaker.beep(60)
hub.speaker.beep(72)

# Esto cierra la puerta.
dial_motor.set_stop_action('coast')
dial_motor.run_to_position(0)
dial_motor.set_degrees_counted(0)
hub.light_matrix.show_image('NO')

# Esto desbloquea la puerta al pulsar el botón izquierdo del Hub.

hub.left_button.wait_until_pressed()
hub.speaker.beep(72)
wait_until(dial_motor.get_degrees_counted, greater_than, 180)
hub.speaker.beep(60)
lock_motor.run_for_seconds(1)
hub.light_matrix.show_image('NO')
wait_for_seconds(2)
hub.light_matrix.show_image('YES')
wait_for_seconds(5)
```

SPIKE™ Prime de LEGO® Education

¡Un sitio superseguro!

https://education.lego.com/es-es/lessons/prime-kickstart-a-business/keep-it-really-safe

```
from spike import PrimeHub, App, Motor
from spike.control import Timer, wait_for_seconds

hub = PrimeHub()
app = App()
dial = Motor('B')
lock = Motor('C')
dial_cover = Motor('E')
timer = Timer()

dial.set_default_speed(75)
lock.set_default_speed(75)
dial_cover.set_default_speed(75)

def unlock():

while not hub.left_button.is_pressed() and dial.get_degrees_counted() < 180:
    hub.speaker.beep(60)
    dial_cover.run_for_degrees(15)
    wait_for_seconds(0.8)

    if timer.now() > 5:
        app.play_sound('Bonk')
        return

    hub.light_matrix.show_image('NO')
    wait_for_seconds(2)
    hub.light_matrix.show_image('YES')
    dial_cover.run_to_position(0)
    lock.run_for_seconds(1)
    app.play_sound('Wand')
    wait_for_seconds(5)

# Esto bloquea la puerta y arranca el mecanismo de protección adicional.

hub.speaker.beep(60)
hub.speaker.beep(72)
lock.run_for_seconds(-1)
dial.run_to_position(0)
dial_cover.run_to_position(0)
dial.set_degrees_counted(0)
dial.set_stop_action('coast')
hub.light_matrix.show_image('NO')
timer.reset()
unlock()
```

SPIKE™ Prime de LEGO® Education

¡Automatízalo!

https://education.lego.com/es-es/lessons/prime-kickstart-a-business/automate-it

```
from spike import App, Motor, ColorSensor
from spike.control import wait_for_seconds

app = App()
base_motor = Motor('A')
arm_motor = Motor('F')
color_sensor = ColorSensor('D')

base_motor.set_default_speed(25)
arm_motor.set_default_speed(25)

def check_color():
    # Esto comprobará el color del paquete.
    arm_motor.run_to_position(235)
    wait_for_seconds(4)
    if color_sensor.get_color() == 'violet':
        base_motor.run_to_position(0)
        arm_motor.run_to_position(25)
        app.play_sound('Triumph')
        arm_motor.run_to_position(240)
    else:
        app.play_sound('Oops')
        arm_motor.run_to_position(25)
        for x in range(3):
            arm_motor.run_for_degrees(-100, speed=100)
            arm_motor.run_for_degrees(100, speed=100)

# Esto enciende el robot y hace que agarre un paquete de cada lado.
base_motor.run_to_position(0)
arm_motor.run_to_position(240)

base_motor.run_to_position(90)
arm_motor.run_to_position(25)

check_color()

base_motor.run_to_position(0)
arm_motor.run_to_position(240)
base_motor.run_to_position(270)
arm_motor.run_to_position(25)

check_color()

base_motor.run_to_position(0)
arm_motor.run_to_position(240)
```

SPIKE™ Prime de LEGO® Education

Break dance

https://education.lego.com/es-es/lessons/prime-life-hacks/break-dance

La lección “Break dance” se ha creado para nuestro lenguaje de programación de bloques de palabra. Actualmente no es posible utilizar exactamente el mismo transcurso de la lección utilizando nuestra programación en Python.

¡Aquí tienes un programa que al menos hará que tu modelo se mueva!

```
from spike import PrimeHub, Motor, ColorSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
leg_motor = Motor('F')
arm_motor = Motor('B')
color_sensor = ColorSensor('D')


leg_motor.set_default_speed(-80)
arm_motor.set_default_speed(-80)


leg_motor.run_to_position(0)
arm_motor.run_to_position(0)
wait_for_seconds(1)

for x in range(10):
    hub.light_matrix.write("1")
    leg_motor.start()
    arm_motor.run_for_rotations(1)
    leg_motor.stop()
    wait_for_seconds(0.45)

    hub.light_matrix.write("2")
    leg_motor.start()
    arm_motor.run_for_rotations(1)
    leg_motor.stop()
    wait_for_seconds(0.45)

    hub.light_matrix.write("3")
    leg_motor.start()
    arm_motor.run_for_rotations(1)
    leg_motor.stop()
    wait_for_seconds(0.45)
```

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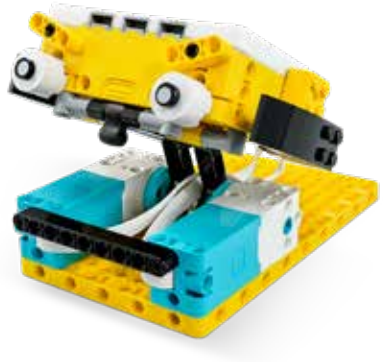
Repetir 5 veces

https://education.lego.com/es-es/lessons/prime-life-hacks/repeat-5-times



```
from spike import PrimeHub, App, Motor
from spike.control import wait_until, wait_for_seconds
from spike.operator import equal_to


hub = PrimeHub()
app = App()
left_leg_motor = Motor('B')
right_leg_motor = Motor('F')
left_leg_motor.set_default_speed(50)
right_leg_motor.set_default_speed(-50)
left_leg_motor.start()
right_leg_motor.start()

wait_until(hub.motion_sensor.get_orientation, equal_to, 'leftside')
right_leg_motor.stop()
left_leg_motor.stop()

app.play_sound('Sport Whistle 1')

for count in range(5):
    left_leg_motor.set_default_speed(-50)
    right_leg_motor.set_default_speed(50)
    left_leg_motor.start()
    right_leg_motor.start()
    wait_until(hub.motion_sensor.get_orientation, equal_to, 'front')
    right_leg_motor.stop()
    left_leg_motor.stop()
    app.start_sound('Male Jump 1')
    hub.light_matrix.write(count + 1)
    wait_for_seconds(0.5)
    left_leg_motor.set_default_speed(50)
    right_leg_motor.set_default_speed(-50)
    left_leg_motor.start()
    right_leg_motor.start()
    wait_until(hub.motion_sensor.get_orientation, equal_to, 'leftside')
    right_leg_motor.stop()
    left_leg_motor.stop()
    wait_for_seconds(0.5)

app.play_sound('Sport Whistle 2')
```

SPIKE™ Prime de LEGO® Education

¿Lluvia o sol?

https://education.lego.com/es-es/lessons/prime-life-hacks/rain-or-shine

La lección “Lluvia o sol” se ha creado para nuestro lenguaje de programación de bloques de palabra. Actualmente no es posible utilizar las funciones de pronóstico meteorológico utilizando nuestra programación en Python.

¡Aquí tienes un programa que hará que el pronosticador meteorológico se mueva!

```
from spike import PrimeHub, App, Motor
from spike.control import wait_for_seconds

hub = PrimeHub()
app = App()
umbrella_motor = Motor("B")
glasses_motor = Motor("F")
YOUR_LOCAL_FORECAST = "sunny"

umbrella_motor.set_default_speed(100)
glasses_motor.set_default_speed(100)


# Esto pone el robot en la posición de partida correcta.
umbrella_motor.run_to_position(45)
glasses_motor.run_to_position(300)

hub.speaker.beep(60, seconds=0.1)
hub.speaker.beep(72, seconds=0.1)

if YOUR_LOCAL_FORECAST == "sunny":
    # Si el día está soleado, ponte las gafas de sol
    glasses_motor.run_to_position(0)
    hub.light_matrix.show_image("SQUARE")
    wait_for_seconds(2)
    glasses_motor.run_to_position(300)
elif YOUR_LOCAL_FORECAST == "rainy":
    # O, si llueve, levanta tu paraguas
    umbrella_motor.run_to_position(340)
    app.play_sound("Rain")
    umbrella_motor.run_to_position(45)
else:
    # De lo contrario, mostrar X
    hub.light_matrix.show_image("NO")
```

SPIKE™ Prime de LEGO® Education

Velocidad del viento

https://education.lego.com/es-es/lessons/prime-life-hacks/wind-speed

La lección “Velocidad del viento” se ha creado para nuestro lenguaje de programación de bloques de palabra. Actualmente no es posible utilizar las funciones de pronóstico meteorológico utilizando nuestra programación en Python.

¡Aquí tienes un programa que al menos hará que tu modelo se mueva!

```
from spike import App, Motor
from spike.control import wait_for_seconds

tilt_motor = Motor("A")
WIND_SPEED_FORECAST = 8

tilt_motor.set_default_speed(20)
tilt_motor.run_to_position(5)


if WIND_SPEED_FORECAST < 5.5:
    tilt_motor.run_for_degrees(30)
    wait_for_seconds(1)
    tilt_motor.run_for_degrees(-30)
else:
    tilt_motor.run_for_degrees(60)
    wait_for_seconds(1)
    tilt_motor.run_for_degrees(-60)
```

SPIKE™ Prime de LEGO® Education

Amor vegetariano

https://education.lego.com/es-es/lessons/prime-life-hacks/veggie-love

La lección "Amor vegetariano" se ha creado para nuestro lenguaje de programación de bloques de palabra. Actualmente no es posible utilizar las funciones de pronóstico meteorológico utilizando nuestra programación en Python.

¡Aquí tienes un programa que al menos hará que tu modelo se mueva!

```
from spike import PrimeHub, App, Motor

hub = PrimeHub()
app = App()
pointer_motor = Motor("E")
pointer_motor.set_default_speed(-50)

WEEK_RAIN = 50
ROTATION = 0


hub.left_button.wait_until_pressed()
pointer_motor.run_for_seconds(2)
pointer_motor.set_degrees_counted(0)
pointer_motor.set_default_speed(50)
pointer_motor.run_for_seconds(2)
hub.light_matrix.write(abs(pointer_motor.get_degrees_counted()))
rotation = int(week_rain * abs(pointer_motor.get_degrees_counted()) / 60)
print(ROTATION)


hub.right_button.wait_until_pressed()
pointer_motor.set_degrees_counted(0)
pointer_motor.set_default_speed(-50)
pointer_motor.run_for_degrees(ROTATION)
hub.light_matrix.write(WEEK_RAIN)
print(WEEK_RAIN)
```

SPIKE™ Prime de LEGO® Education

Juego mental

https://education.lego.com/es-es/lessons/prime-life-hacks/brain-game

```
from spike import PrimeHub, App, Motor, ColorSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
app = App()
mouth_motor = Motor('A')
color_sensor = ColorSensor('B')
candy1 = []
candy2 = []


while True:
    hub.left_button.wait_until_pressed()

    # Esto hace que el Director de juego se coma el bastón de caramelo y a continuación lea y registre su secuencia de colores en la lista llamada «Caramelo1».
    hub.light_matrix.off()
    candy1.clear()
    mouth_motor.set_default_speed(-50)
    mouth_motor.run_for_seconds(2)
    app.play_sound('Bite')
    app.play_sound('Bite')

    for x in range(5):
        candy1.append(color_sensor.get_color())
        wait_for_seconds(1)
        mouth_motor.set_default_speed(50)
        mouth_motor.run_for_degrees(95)
        wait_for_seconds(1)

    hub.right_button.wait_until_pressed()


   # Esto hace que el Director de juego se coma el bastón de caramelo y a continuación lea y registre su secuencia de colores en la lista llamada «Caramelo2».
    candy2.clear()
    mouth_motor.set_default_speed(-50)
    mouth_motor.run_for_seconds(2)
    app.play_sound('Bite')
    app.play_sound('Bite')

    for x in range(5):
        candy2.append(color_sensor.get_color())
        wait_for_seconds(1)
        mouth_motor.set_default_speed(50)
        mouth_motor.run_for_degrees(95)
        wait_for_seconds(1)

    # Ilumina la posición de los ladrillos rojos si están en la misma posición en los dos bastones de caramelo.
    candy1_red_index = candy1.index('red')
    candy2_red_index = candy2.index('red')
    for x in range(5):
        print(candy1[x])


    if candy1_red_index == candy2_red_index:
        for x in range(5):
            hub.light_matrix.set_pixel(x, candy1_red_index)
        app.play_sound('Win')
    else:
        app.play_sound('Oops')
```

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El entrenador

https://education.lego.com/es-es/lessons/prime-life-hacks/the-coach

```
from spike import Motor
from spike.control import Timer, wait_for_seconds

left_leg_motor = Motor('F')
right_leg_motor = Motor('B')
timer = Timer()
left_leg_motor.run_to_position(0)
right_leg_motor.run_to_position(0)

while True:
    while timer.now() < 5:
        left_leg_motor.start_at_power(-80)
        right_leg_motor.start_at_power(80)
        wait_for_seconds(0.1)
        left_leg_motor.start_at_power(80)
        right_leg_motor.start_at_power(-80)
        wait_for_seconds(0.1)
```

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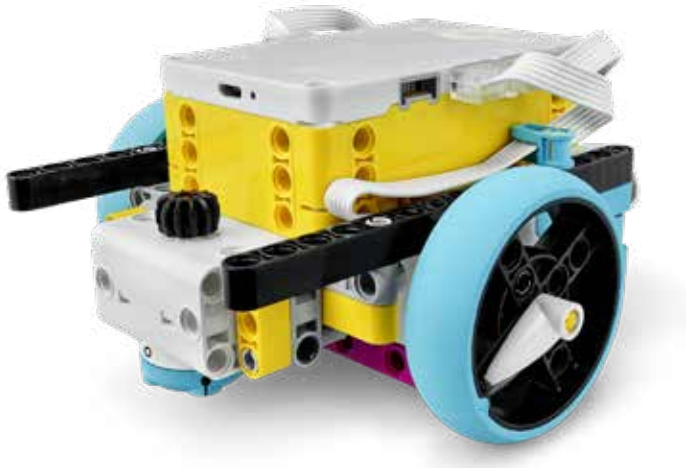
Campamento de entrenamiento 1

https://education.lego.com/es-es/lessons/prime-competition-ready/training-camp-1-driving-around



```
from spike import MotorPair
from spike.control import wait_for_seconds


drive_motors = MotorPair('C', 'D')


drive_motors.set_default_speed(30)
drive_motors.set_motor_rotation(17.5, 'cm')


wait_for_seconds(1)

for x in range(4):
    drive_motors.move(10, 'cm')
    wait_for_seconds(0.5)
    drive_motors.move(182, 'degrees', steering=100)
```

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Campamento de entrenamiento 2

https://education.lego.com/es-es/lessons/prime-competition-ready/training-camp-2-playing-with-objects

```
from spike import PrimeHub, MotorPair, Motor, DistanceSensor
from spike.control import wait_for_seconds


hub = PrimeHub()
drive_motors = MotorPair('C', 'D')
grabber_motor = Motor('E')
distance_sensor = DistanceSensor('F')


drive_motors.set_default_speed(30)
drive_motors.set_motor_rotation(17.5, 'cm')
grabber_motor.set_default_speed(-20)
grabber_motor.run_for_seconds(1)
grabber_motor.set_default_speed(20)
grabber_motor.run_for_degrees(75)

hub.speaker.beep(60)
hub.speaker.beep(72)

hub.right_button.wait_until_pressed()

wait_for_seconds(1)

drive_motors.start()
distance_sensor.wait_for_distance_closer_than(10, 'cm')
drive_motors.stop()

grabber_motor.run_for_degrees(-75)

hub.speaker.beep(60)
hub.speaker.beep(72)

drive_motors.move(-20, 'cm')
```

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Campamento de entrenamiento 3

https://education.lego.com/es-es/lessons/prime-competition-ready/training-camp-3-react-to-lines

```
from spike import PrimeHub, MotorPair, ColorSensor
from spike.control import wait_for_seconds

hub = PrimeHub()
drive_motors = MotorPair('C', 'D')
color_sensor = ColorSensor('B')

drive_motors.set_default_speed(50)
POWER = 50

while True:
    if hub.left_button.was_pressed():
        drive_motors.start()
        color_sensor.wait_until_color('black')
        drive_motors.stop()

    if hub.right_button.was_pressed():
        while True:
            drive_motors.start_tank_at_power(0, POWER)
            color_sensor.wait_until_color('black')
            drive_motors.start_tank_at_power(POWER, 0)
            color_sensor.wait_until_color('white')
```

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Montar una base de conducción avanzada

https://education.lego.com/es-es/lessons/prime-competition-ready/assembling-an-advanced-driving-base

```
from spike import PrimeHub, MotorPair
from spike.control import wait_for_seconds, wait_until
from spike.operator import greater_than, less_than


hub = PrimeHub()
drive_motors = MotorPair('A', 'E')


drive_motors.set_default_speed(50)
drive_motors.set_motor_rotation(27.63, 'cm')


wait_for_seconds(1)

drive_motors.move(20, 'cm')
drive_motors.move(-20, 'cm')

drive_motors.move(20, 'cm', steering=-40)

hub.motion_sensor.reset_yaw_angle()

drive_motors.start(steering=100)
wait_until(hub.motion_sensor.get_yaw_angle, greater_than, 90)
drive_motors.stop()

drive_motors.start(steering=-100)
wait_until(hub.motion_sensor.get_yaw_angle, less_than, 0)
drive_motors.stop()
```

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Mi código, nuestro programa

https://education.lego.com/es-es/lessons/prime-competition-ready/my-code-our-program

```
from spike import PrimeHub, MotorPair
from spike.control import wait_for_seconds


hub = PrimeHub()
drive_motors = MotorPair('A', 'E')


drive_motors.set_default_speed(50)
drive_motors.set_motor_rotation(27.63, 'cm')


def square():
    for x in range(4):
        drive_motors.move(1.5, 'rotations')
        drive_motors.move(0.365, 'rotations', steering=100)


def triangle():
    for x in range(3):
        drive_motors.move(1.5, 'rotations')
        drive_motors.move(0.486, 'rotations', steering=100)


def circle():
    drive_motors.move(3, 'rotations', steering=60)


wait_for_seconds(1)

square()
hub.speaker.beep()

triangle()
hub.speaker.beep()

circle()
hub.speaker.beep()
```

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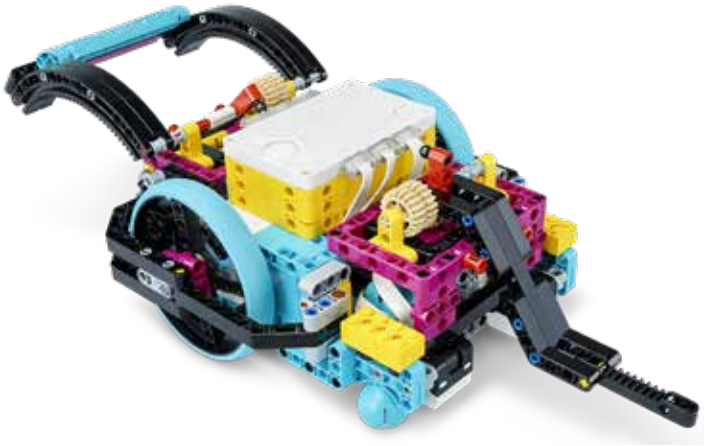
¡Hora de mejorar!

https://education.lego.com/es-es/lessons/prime-competition-ready/time-for-an-upgrade



```
from spike import PrimeHub, Motor


hub = PrimeHub()
lift_arm_motor = Motor('D')
dozer_blade_motor = Motor('C')


lift_arm_motor.set_default_speed(-100)
lift_arm_motor.run_for_seconds(1)
dozer_blade_motor.set_default_speed(-100)
dozer_blade_motor.run_for_seconds(1)

lift_arm_motor.set_default_speed(100)
lift_arm_motor.run_for_degrees(70)
dozer_blade_motor.set_default_speed(100)
dozer_blade_motor.run_for_degrees(70)
hub.speaker.beep()

lift_arm_motor.run_for_degrees(180)
lift_arm_motor.run_for_degrees(-180)
dozer_blade_motor.run_for_degrees(180)
dozer_blade_motor.run_for_degrees(-180)
hub.speaker.beep()

lift_arm_motor.run_for_degrees(180, speed=15)
lift_arm_motor.run_for_degrees(-180, speed=15)
dozer_blade_motor.run_for_degrees(180, speed=15)
dozer_blade_motor.run_for_degrees(-180, speed=15)
```

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Listo para la misión

https://education.lego.com/es-es/lessons/prime-competition-ready/mission-ready

```
from spike import Motor, MotorPair
from spike.control import wait_for_seconds


dozer_blade_motor = Motor('C')
lift_arm_motor = Motor('D')
drive_motors = MotorPair('A', 'E')


drive_motors.set_default_speed(25)
drive_motors.set_motor_rotation(27.63, 'cm')


dozer_blade_motor.start(-100)
lift_arm_motor.start(-100)
wait_for_seconds(1)
dozer_blade_motor.stop()
lift_arm_motor.stop()

dozer_blade_motor.run_for_degrees(70, speed=100)
lift_arm_motor.run_for_degrees(20, speed=100)

drive_motors.move(-2, 'cm')
drive_motors.move(10.5, 'cm')

dozer_blade_motor.run_for_degrees(180, speed=40)

drive_motors.move(-6, 'cm')

dozer_blade_motor.run_for_degrees(-180, speed=60)
dozer_blade_motor.run_for_degrees(180, speed=60)

drive_motors.move(7, 'cm')

dozer_blade_motor.run_for_degrees(-180, speed=60)

drive_motors.move(0.405, 'rotations', steering=-100)
drive_motors.move(60.5, 'cm', steering=-30)
drive_motors.move(34, 'cm')
drive_motors.move(32, 'cm', steering=-50)
drive_motors.move(17.5, 'cm')
drive_motors.move(0.415, 'rotations', steering=-100)
drive_motors.move(32, 'cm')
```

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Pasa el ladrillo

https://education.lego.com/es-es/lessons/prime-extra-resources/pass-the-brick

```
from spike import Motor, PrimeHub


hub = PrimeHub()
grabber_motor = Motor('F')


# Esto hará que la mano se abra una vez para comenzar.
grabber_motor.run_for_seconds(1)

while True:
    # Esto hará que la mano se cierre cuando pulses el botón izquierdo del Hub.
    hub.left_button.wait_until_pressed()
    grabber_motor.set_stall_detection(False)
    grabber_motor.start(-75)

   # Esto hará que la mano se abra cuando pulses el botón izquierdo del Hub.
    hub.left_button.wait_until_released()
    grabber_motor.set_stall_detection(True)
    grabber_motor.start(75)
```

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Ideas, ial estilo LEGO!

https://education.lego.com/es-es/lessons/prime-extra-resources/ideas-the-lego-way

```
from spike import PrimeHub
from spike.control import wait_for_seconds


hub = PrimeHub()


while True:
    if hub.left_button.was_pressed():
        hub.light_matrix.write('3')
        wait_for_seconds(1)
        hub.light_matrix.write('2')
        wait_for_seconds(1)
        hub.light_matrix.write('1')
        wait_for_seconds(1)
        hub.light_matrix.off()
        hub.speaker.beep(60, 0.5)
        hub.speaker.beep(72, 0.5)

    if hub.right_button.was_pressed():
        hub.light_matrix.write('5')
        wait_for_seconds(60)
        hub.light_matrix.write('4')
        wait_for_seconds(60)
        hub.light_matrix.write('3')
        wait_for_seconds(60)
        hub.light_matrix.write('2')
        wait_for_seconds(60)
        hub.light_matrix.write('1')
        wait_for_seconds(60)
        hub.light_matrix.off()
        hub.speaker.beep(60, 0.5)
        hub.speaker.beep(72, 0.5)
```

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¿En qué consiste?

https://education.lego.com/es-es/lessons/prime-extra-resources/what-is-this

```
from spike import Motor


motor = Motor('F')


motor.set_stall_detection(False)

for x in range(5):
    motor.set_default_speed(50)
    motor.run_for_seconds(2)
    motor.set_default_speed(-50)
    motor.run_for_seconds(2)
```

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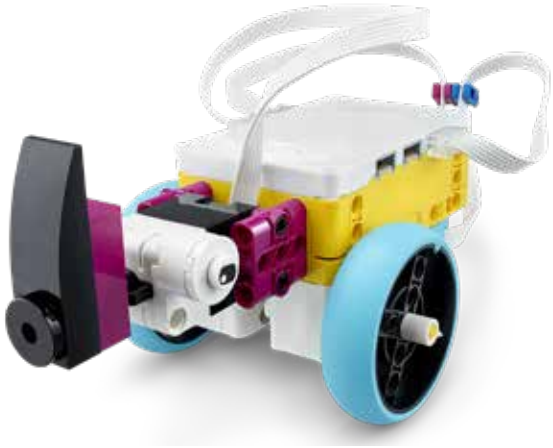
Cubrir la distancia

https://education.lego.com/es-es/lessons/prime-extra-resources/going-the-distance



```
from spike import MotorPair

drive_motors = MotorPair('B', 'A')

drive_motors.set_default_speed(50)

drive_motors.move(10, 'rotations')
drive_motors.stop()
```

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¡Gol!

https://education.lego.com/es-es/lessons/prime-extra-resources/goal

```
from spike import PrimeHub, Motor
from spike.control import wait_for_seconds


hub = PrimeHub()
kicker = Motor('A')
kicker.set_default_speed(100)


while True:
    kicker.run_to_position(0)

    hub.left_button.wait_until_pressed()
    kicker.run_for_rotations(1)
    wait_for_seconds(1)
```