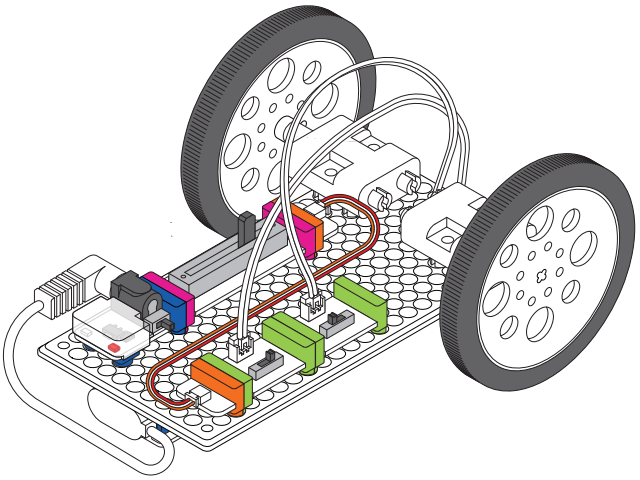
littleBits

SPEED RACER



GUIDED

DESIGN CHALLENGE
Design and measure the speed of a self-propelled racecar.

WRITE

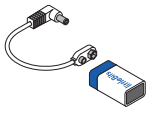
EXPLORE

- Complete Writing Box #1 in your guided handout.

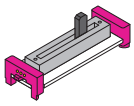
CREATE

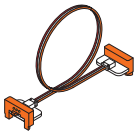
CREATE

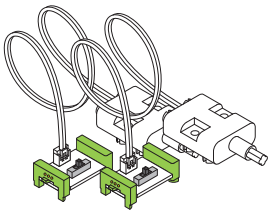
1. Gather all of your invention tools.


a1 battery & cable

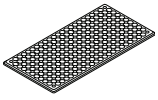

p4 power

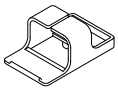

i5 slide dimmer


w1 wire


o25 DC motor (x2)


a25 wheel (x2)

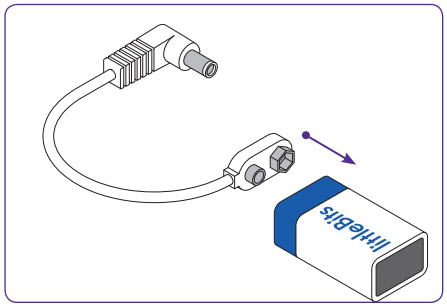

a30 mounting board

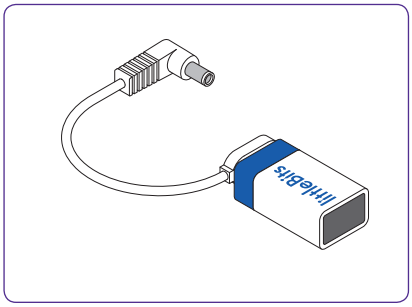

a31 battery clip

Other materials:

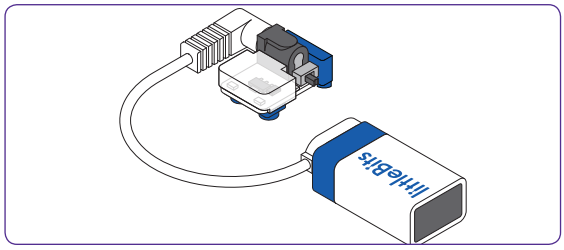
- Meter stick
- Stopwatch
- Masking tape
- Optional: Craft and recycled materials for decoration

2. Attach the battery cable to the battery.

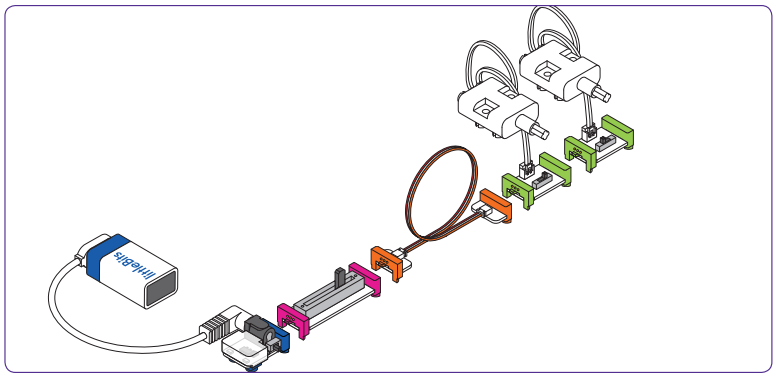




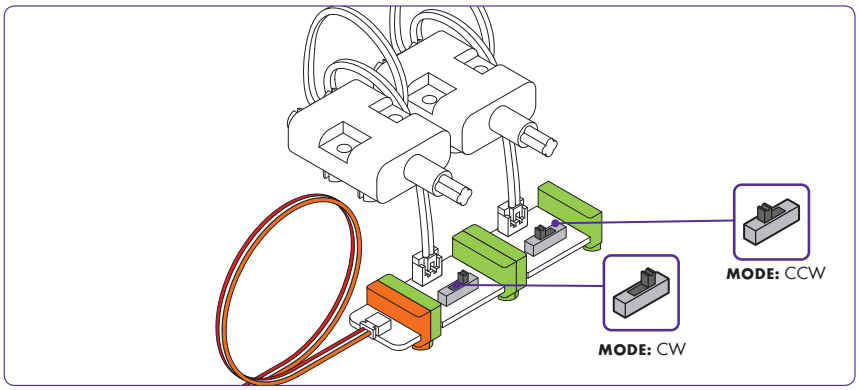
3. Attach the power Bit to the battery cable assembly.



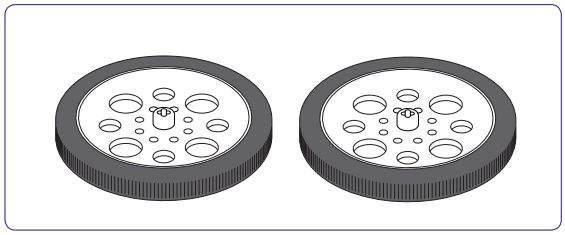
4. Snap this circuit together.



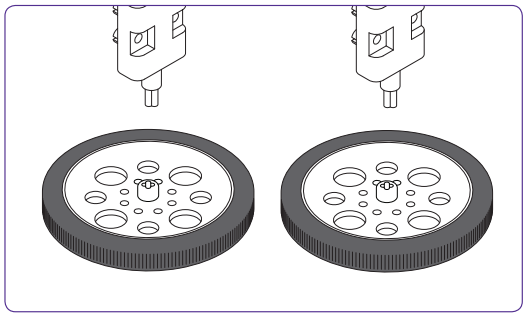
5. Set one motor to "CW" mode for clockwise and the other motor to "CCW" for counter clockwise.



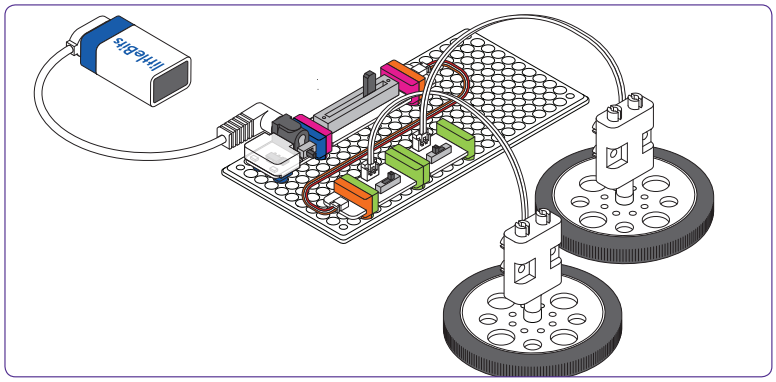
6. Now pick up both wheels and lay it on the table with the longer axle facing up.



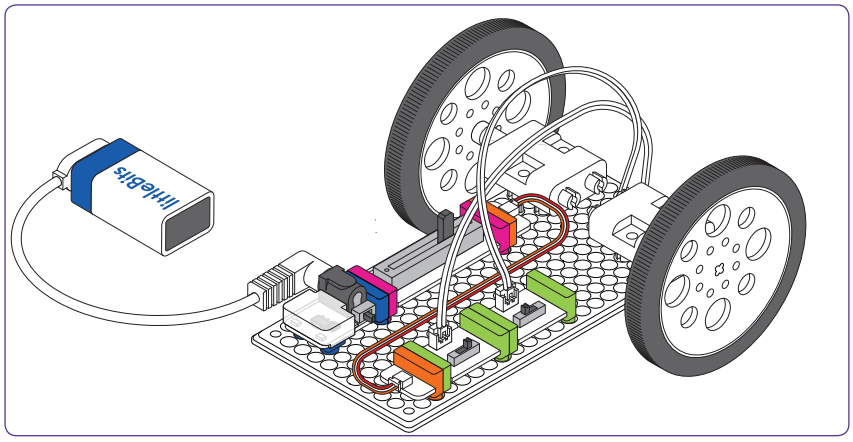
7. Press a wheel onto each motor. Make sure that the cross hole of the wheel lines up with the cross axle of the motor.



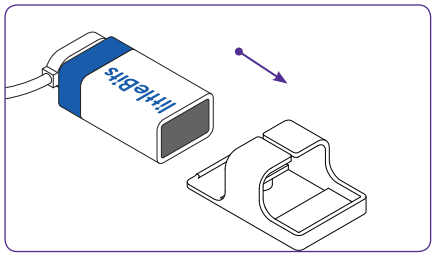
8. Press your circuit onto the mounting board as shown.



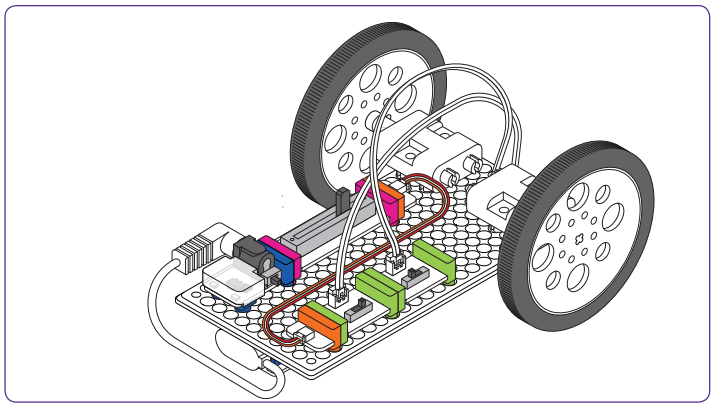
9. Press the DC motors with wheels on either side of the mounting board.



10. Slide the battery into the battery clip.



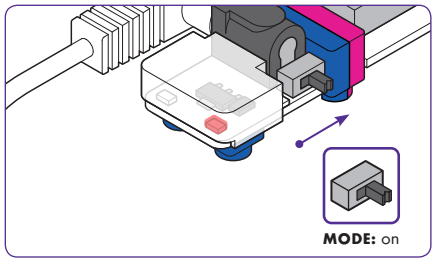
11. Press the battery clip into the bottom of the mounting board. The battery clip should be touching the floor.



PLAY

PLAY

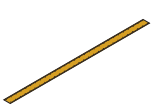
12. Test out your car! Power on your circuit.



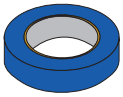
13. Use the slide dimmer to change the speed of your car. Your car should move in a straight line. If it's spinning in a circle or moving backwards,double check that your DC motor settings match step #5.

Let's Measure the Speed of our Racecar!

14. Gather your testing materials.


meter stick


stopwatch


masking tape

WRITE

15. Complete Writing Box #2 and #3 in your guided handout.

SHARE

- Complete Writing Box #4 in your guided handout.

CLEAN UP

- **Until next time, littleBits!** Place the Bits gently back in the box according to the diagram on the back of the Bit Index; return classroom materials to their proper place and check the area around your workstation.

littleBits

SPEED RACER

Name:

CHALLENGE OVERVIEW

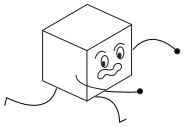
Let's design and measure the speed of a self-propelled racecar!

GUIDING QUESTIONS TO REACH LEARNING OBJECTIVES

How can we describe and measure the motion of an object?

CREATE

1. Sketch yourself riding in a car. Draw and label something that might affect the motion of the car. How might you be able to tell if the car's speed changes?



PLAY

2. How will you know how fast your racecar is traveling? Describe or draw your plan.

3. Test your racecar and write down the results. Each person in the group takes a turn! Be sure to include units in your calculations.

	TIME	DISTANCE	SPEED
TRIAL 1			
TRIAL 2			
TRIAL 3			
TRIAL 4			
TRIAL 5			

Bonus!
AVERAGE SPEED

SHARE

4. Did you get the same results each time you tested your racecar? If not, why do you think the results were different?