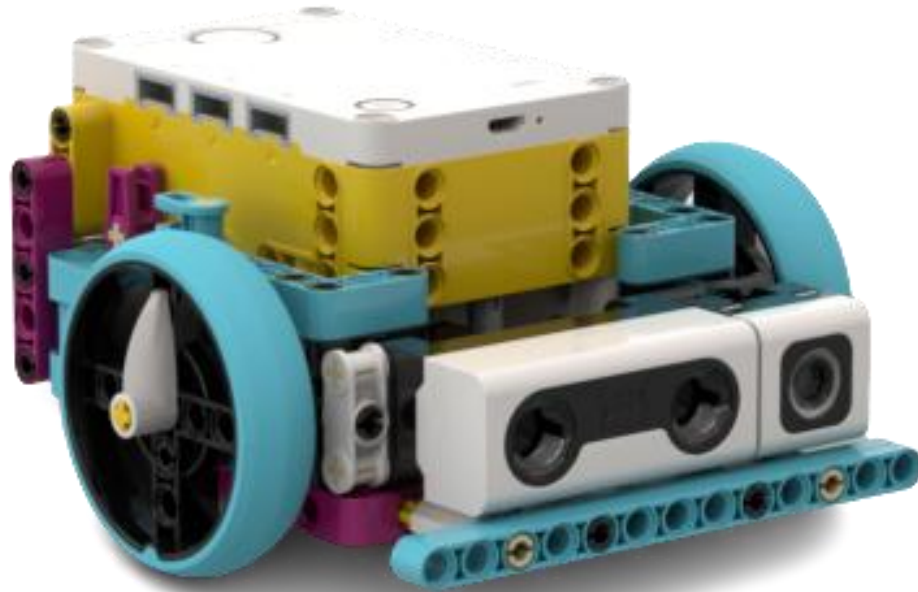


# MOVEMENT



## Movement Unit Activities

Make a robot move using time. [Exploration 1](#)

Make a robot turn using time. [Exploration 2](#)

Complete a robot move challenge. [Challenge 1](#)



# MOVEMENT

LEGO Education SPIKE - 2.0.6

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SPIKE Prime

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Click the New Project button.

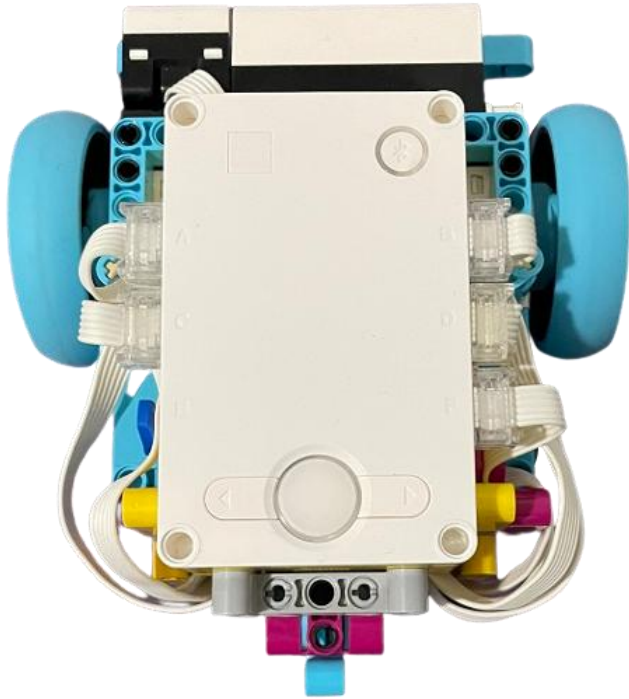
Unit Plans

Building Instructions





# MOVEMENT



The Robocar motors that make it move are connected to ports A and B.

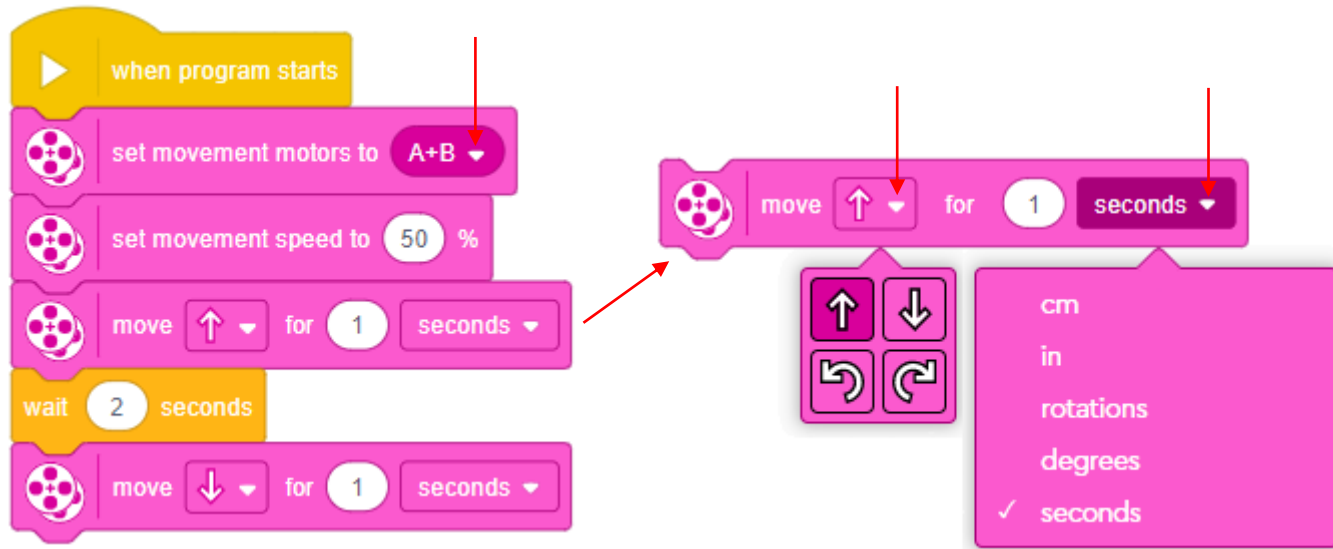
If for some reason the motors are not connected to ports A and B, please let Mr. Desmond know.

Do not connect the light. For now, it is purposefully disconnected from port C.



# MOVEMENT – FORWARD AND BACKWARD

Create a code sequence to have the Robocar move forward for one second and then backward for one second.

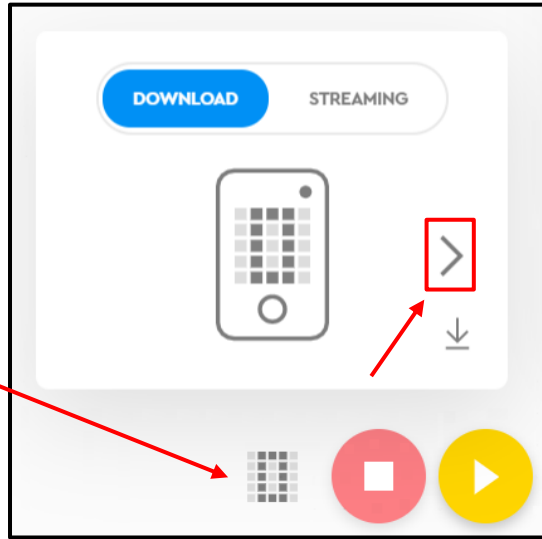


Make the code sequence then go the next page.

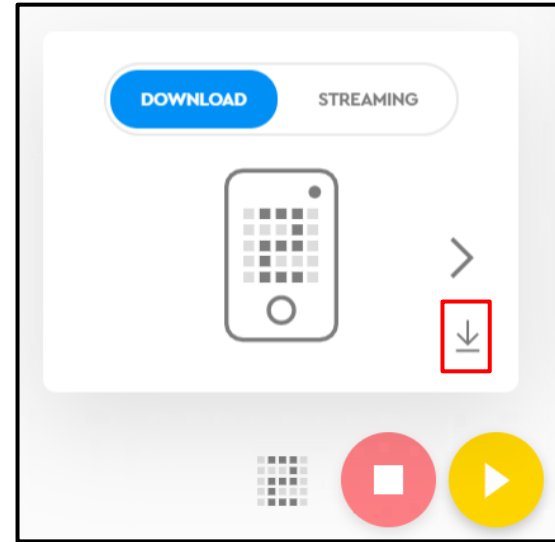


# MOVEMENT – FORWARD AND BACKWARD

Click the program memory slot button.



Change the program memory slot to 2.



Download the program to Spike.



# MOVEMENT – FORWARD AND BACKWARD

1) Run your program from Spike. Make note of how far forward the Robocar travels at 50% speed for 1 second.

2) Change the time in your code to 2 seconds.

Run your program. Make note of how far forward the Robocar travels at 50% speed for 2 seconds.

3) Change the time in your code to 3 seconds.

Run your program. Make note of how far forward the Robocar travels at 50% speed for 3 seconds.



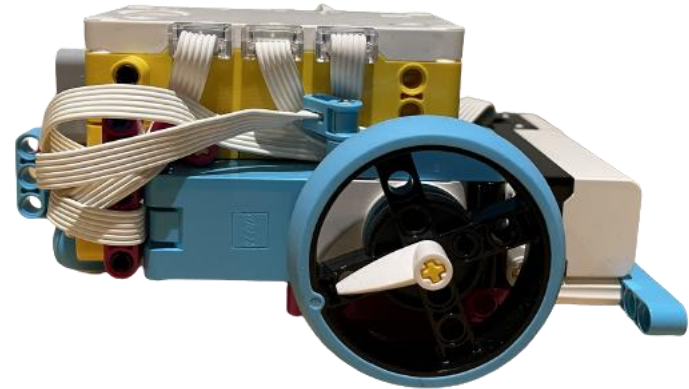
# MOVEMENT – FORWARD AND BACKWARD

Think about it, discuss your ideas as a group, and then write your answers on a piece of paper.



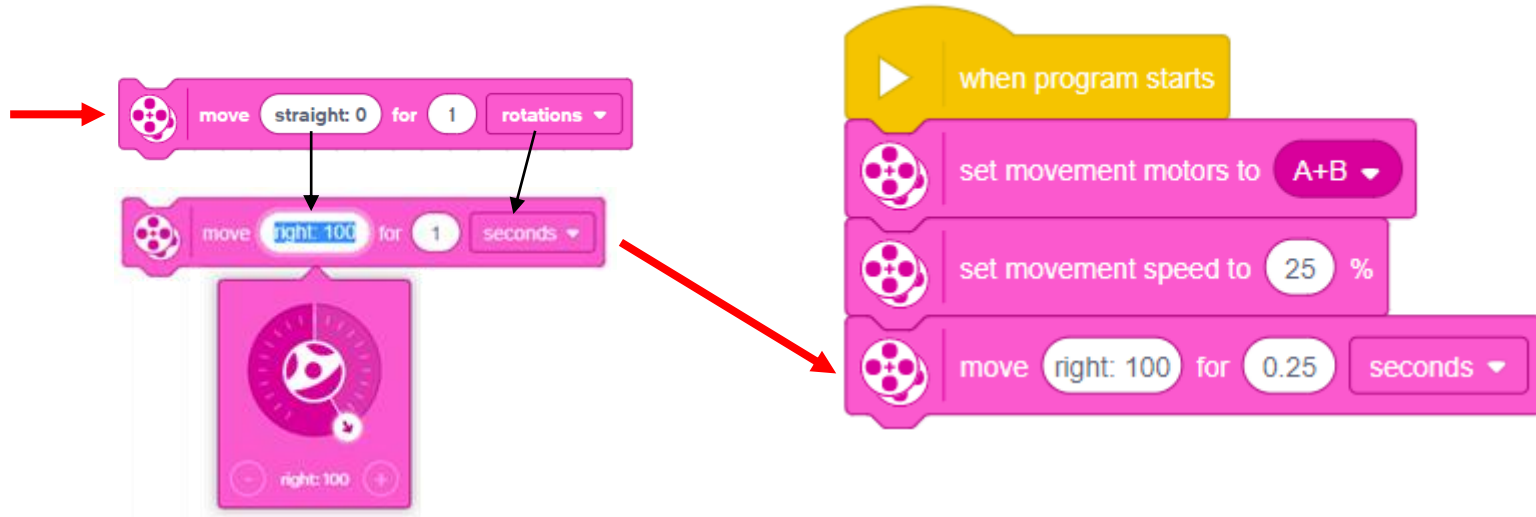
1) Explain how time affects the distance the Robocar will travel.

Check in with Mr. Desmond.  
Be prepared to show your work  
and discuss your ideas.



# MOVEMENT - STEERING

Create a code sequence to have the Robocar drive at 25% speed and move right 100 for 0.25 seconds.



Download the program to Spike.



# MOVEMENT - STEERING

1) Run your program.

Make note of how far the Robocar turned after 0.25 seconds.

2) Change the time in your code to 0.50 seconds.

Run your program. Make note of how far the Robocar turned after 0.50 seconds.

3) Change the time in your code to 1 second.

Run your program. Make note of how far the Robocar turned after 1 second.



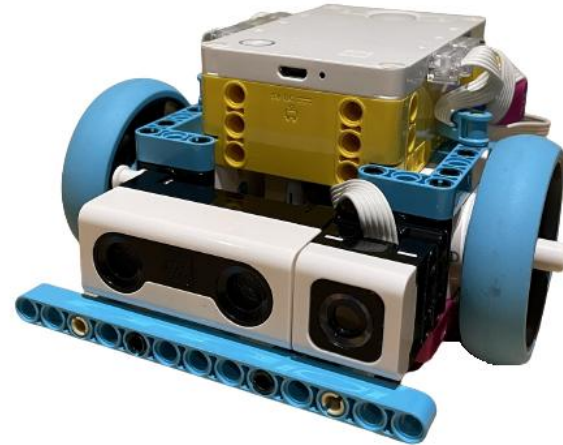
# MOVEMENT - STEERING

Think about it, discuss your ideas as a group, and then write your answers on a piece of paper.



1) Explain how time affects how much the Robocar turns (distance).

Check in with Mr. Desmond.  
Be prepared to show your work  
and discuss your ideas.



# MOVEMENT – CONSIDER THIS

When the motor runs it is the motor spindle that is moving (spinning). The Robocar's wheels are attached to the motor spindle. That means the wheels spin at the same time and at the same rate as the spindle.



motor spindle



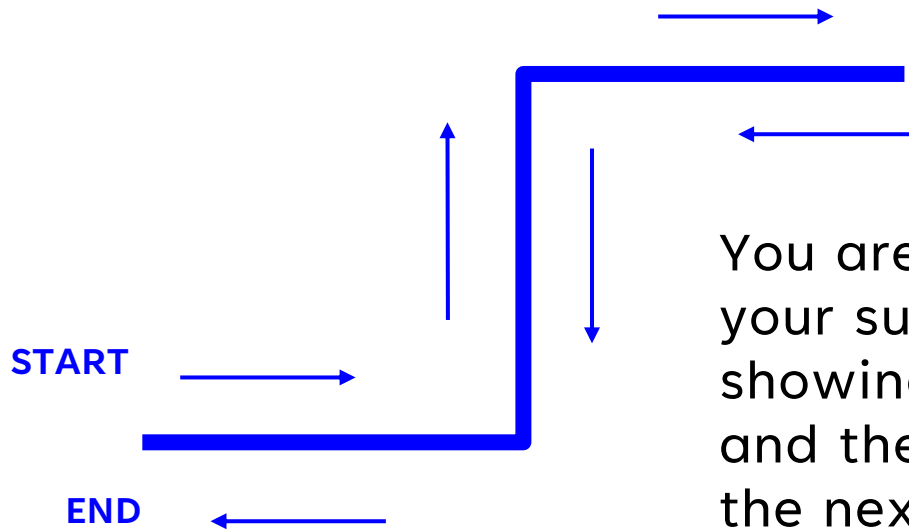
When the motor runs the spindle moves for a certain duration as controlled by the coding. For example, if we were to code the Robocar's motors to move for 720 degrees each motor spindle would complete two rotations and spin in a full circle two times. The Robocar would **not** turn in a circle two times.



# MOVEMENT – CHALLENGE

## The Two Corner Turnaround Challenge

Program the Robocar using seconds as the duration unit to complete movement along the path of the design below. Each move should be about 25 cm.



Make the turns as precise as possible.

You are expected to demonstrate your success to Mr. Desmond - showing both the robot in action and the code before you begin the next activity.