

## LESSON 6

# Build your Move Motor Sensor Car

60 minutes (2 periods)

Building Basic Robotic Systems

### WHAT THIS LESSON DOES

Unpack your Move Motor Sensor Car kit and lay out the contents. Follow the step-by-step instructions in the yellow booklet to assemble the car, connect to Makecode, add the Move Motor Extension, and code the motors. Explore the buzzer, Zip LEDs, line following sensors, and the distance sensor. Once built, experiment with different movements and LED uses.

### WHAT STUDENTS SHOULD BE ABLE TO DO

- Develop practical skills in assembling a Move Motor Sensor Car.
- Understand how to connect the Move Motor Sensor Car to Makecode.
- Acquire coding skills for controlling the motors, buzzer, and LEDs of the Move Motor Sensor Car.
- Learn to utilise the line following and distance sensors for navigation.
- Encourage exploration and creativity in coding for different movements and LED usage.

### BEFORE THE BELL

- Count out one Move Motor Sensor Car package per student or pair, each with its yellow instruction booklet intact.
- Prepare one micro:bit and four AA batteries per car. Check batteries and connectors the day before.
- Open MakeCode on a class device and confirm it loads on the school network.

## Build your Move Motor Sensor Car

### HOW THE LESSON RUNS

|                               |
|-------------------------------|
| Open the package              |
| Follow the instructions       |
| Assembling: Move Motor        |
| Getting Connected to Makecode |
| Add in :Move Motor Extension  |
| Coding the Motors             |
| The Buzzer                    |
| The Zip LEDs                  |
| The Line Following Sensors    |
| The Distance Sensor           |
| Explore                       |

### TEACHING MOVES

- 1. Open the package. Have students tip out the kit and lay every part on the table with the micro:bit and four AA batteries before anyone starts building.
- 2. Follow the instructions. Hold up the yellow booklet. Tell the class to work only from its numbered sections, finishing one before flipping to the next.
- 3. Assembling: Move Motor. Circulate while they build section 1. Stop the room if a common fit looks wrong so nobody seats motors or sensors backwards.
- 4. Getting Connected to Makecode. Get one pair on screen first. Confirm the micro:bit shows as connected before the rest of the class follows section 2.
- 5. Add in :Move Motor Extension. Check each project has the Move Motor extension loaded so the motor and sensor blocks actually appear in the toolbox.
- 6. Coding the Motors. After they flash section 4, ask pairs to show forward, stop and a turn on the desk before moving on.
- 7. The Buzzer. Keep volume and test time short. One clear beep on command is enough to prove the block works.
- 8. The Zip LEDs. Have them set a simple colour change they can see from their seat, then reset before the sensor sections.
- 9. The Line Following Sensors. Give a short stretch of dark line on pale ground. Ask what reading they get on and off the line before they trust it to steer.
- 10. The Distance Sensor. Have one student hold a flat obstacle at arm's length while the other watches the reading change as the hand moves closer.
- 11. Explore. Set a free challenge: combine motor moves with Zip LED patterns. Stay hands-off unless a car will not run at all.

### WHAT TO WATCH FOR

- Students think the car is broken when motor blocks are missing, but the Move Motor extension was never added to the MakeCode project. Open Extensions with them and add Move Motor, then reload the toolbox before troubleshooting hardware.
- Students treat a successful download as proof the car works, even when batteries are flat or the micro:bit is seated poorly. Before any debug of code, check battery fit, power switch and that the micro:bit is fully pushed into the connector.
- Students expect line-following or distance readings to steer the car without testing raw sensor values first. Have them display or watch live readings on and off a line, and near and far from a hand, before writing navigation logic.

### DIFFERENTIATION

- Emerging: Pair them with a neighbour whose build already matches the booklet photo, and stay for the first motor flash. Let them finish assembly and one working motor move before touching sensors.
- Developing: Ask them to talk through the next booklet step aloud before they drag blocks. Have them repeat the motor test after each small code change so they see cause and effect.
- Proficient: Challenge them to combine motors with Zip LEDs in one program, for example lights that change on a turn. Ask them to explain their sensor readings to a pair still on the motor section.