

Build your Move Motor Sensor Car

60 minutes**Designing and Building for the Future**

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 LESSON

- One Move Motor Sensor Car package per pupil or pair, with the yellow instruction booklet inside
- A micro:bit and four AA batteries ready for each car
- Devices that can open MakeCode and connect to the micro:bit
- Clear table space so parts can be laid out before assembly

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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 pupils open the package and lay every part on the table. Check each group also has a micro:bit and four AA batteries before building starts.
2. Follow the instructions. Show the yellow booklet and say it is the guide for the whole build and coding sequence. Keep groups on the same section as you move on.
3. Assembling: Move Motor. Circulate while they follow booklet section 1. Pause anyone whose chassis, motors or wiring do not match the diagrams before they continue.
4. Getting Connected to Makecode. Support each group through booklet section 2 so the micro:bit is connected to MakeCode and ready to receive code.
5. Add in :Move Motor Extension. Check every MakeCode project has the Move Motor extension added from booklet section 3 before any motor blocks are used.
6. Coding the Motors. As they finish booklet section 4, have them download and run the motor code on the car so forward, turn and stop are seen on the floor.
7. The Buzzer. After booklet section 5, ask them to trigger the buzzer once so the whole group hears that the output works.
8. The Zip LEDs. Have pupils run their Zip LED code on the car and confirm the lights match what they set in booklet section 6.
9. The Line Following Sensors. Use a clear line on a simple surface. Let them test booklet section 7 so left and right sensor responses are easy to see.
10. The Distance Sensor. Place one obstacle in front of the car. Have them run booklet section 8 and watch how distance readings change as the car nears it.
11. Explore. Invite them to try their own movement paths and LED patterns. Stay available for download issues rather than setting a new fixed task.

WHAT TO WATCH FOR

- Pupils think on-screen MakeCode blocks will drive the car without downloading to the micro:bit. After each coding section, insist they download and watch the car before changing more blocks.
- Line-following seems broken because the floor has no clear line or is too reflective. Give a simple dark line on a plain surface and retest one sensor at a time.
- The car does nothing because batteries are missing, flat or inserted the wrong way. Before troubleshooting code, check battery fit, orientation and that the power switch is on.

DIFFERENTIATION

- Emerging: Pair with a partner for assembly and the first MakeCode connection so one can hold parts while the other follows the booklet. Stay on motors and buzzer until those run reliably before adding sensors.
- Developing: Keep them one booklet section at a time and ask them to show the car working before they open the next section. Have them explain what each new block does in their own words after it runs on the car.
- Proficient: In Explore, challenge them to combine turns, stops, LEDs and the buzzer in one sequence. Ask them to use the distance or line sensors in a short path of their own design.