

Y9 ROBOTICS Arduino Robot Car Lesson Plan - Ilia Vialykh



February 27, 2023

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Time / Subject	Lesson Progression	Differentiation	Resources

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Friday Y9 Blue am 9.15-10.10 Robotics Lab B309 17 Learners Age: 13-14 55 minutes	Arduino Car Moves and Turns <u>Inquiry:</u> Motor control and programming structures in Arduino. Can we learn to control robots before they start controlling us? <u>LO:</u> All students can list the components of Arduino robot car and their functions. Most students can write and upload code to the Arduino board to control the robot's movements. Most students can wire up the components together. Some students can analyse the issues in wiring or in motor control programming and troubleshoot them. <u>Review:</u> Arduino and its IDE. Motors, H-bridges, sensor shields. Programming basics: variables, loops and functions. (5 minutes) <u>Engage:</u> Design the circuit diagram, draw circuit diagram on the board, whole class discussion (5 minutes) <i>Can there be other solutions?</i> <i>How is your car going to turn left and right? Can you log the active channels wheels movement for moving forwards, backwards, left, and right?</i> <u>Intro:</u> Teacher shows the working model of a robot car and demonstrates it can move forwards, backwards, left, and right (5 minutes) <u>Explore:</u> Students assemble the robot cars. (25 minutes) <u>Elaborate:</u> Students upload the code to their robot cars (5 minutes) Code: https://www.thiscodeworks.com/moving-forward-robot-car/63e9e0eae6e2c8001339a825 Students modify the code and get their robot cat to execute movements: forward, backward, left and right. Students record their progress in the engineering books (10 minutes) Assessment	Group work Lower: Working with students to help them construct a car, giving them hints on the programme design. Higher: Giving students more independence. Challenging the students to try creating functions in their programme rather than writing code that is not compartmentalized	Classroom resources Computers with Arduino IDE installed Arduino Uno board Motor driver shields L298N DC motors Robot car chassis Wheels Power supply (power banks) Jumper wires Arduino sensor shields
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	Students' engineering books are assessed according to the following rubric: https://docs.google.com/presentation/d/1jEgWLi3y0JCdfyj4sA5aZGf2euOBGZjS7YklEkO3_oc/edit?usp=sharing Reflection: Have each student choose and share what was the easiest and the hardest part of the project for their group		
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