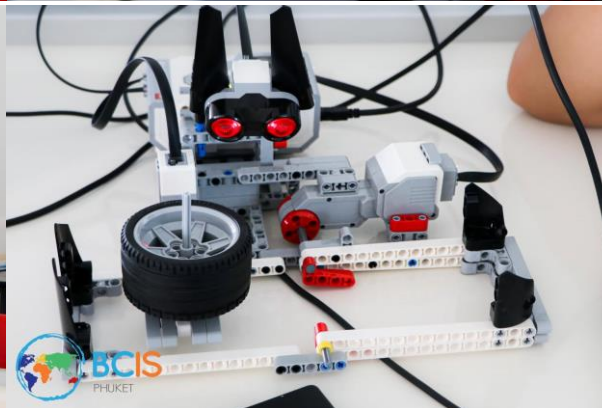
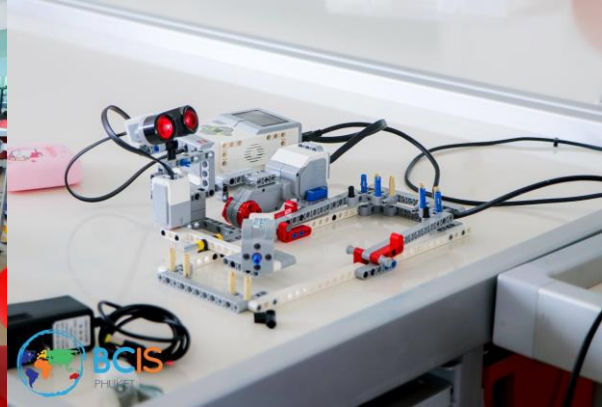


KS3 Lesson Plan - Ilia Vialykh



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Friday October 21, 2022

Time / Subject	Lesson Progression	Differentiation	Resources
Friday Y7-O 9:15 - 10:15 Y7-B 14:30 - 15:30	Mission Impossible Inquiry: How can sensors be used? What is ultrasound? LO: Learn to use ultrasonic sensors to detect objects and teach the robot to react to obstacles. Review: Moves and turns, driving base, driving base extensions, Blockly. Engage: Sensor-extensions enable robots to react to their environment and avoid collisions. Get the students to discuss how useful it is. <i>Do you know of any robots that can detect objects?</i> <i>Why is it useful for robots to be able to detect objects?</i> <i>What's ultrasound, and how does an Ultrasonic Sensor work?</i> Intro: Teacher demonstrates a robot with an ultrasound sensor and asks the students to try to control it with "force". Explore: Students discover how ultrasonic sensors work, understand the principle of the sonar and how obstacles are detected. They design an extension with the sonar for their LEGO EV3 driving bases. They use programming stacks in EV3 classroom application to programme the robot so that it either avoids the obstacles continuously, follows the object or the students can use "force" to control their robot.	Group work Lower: Working with students to help them construct an extension. Spend more time with a group that needs support explaining how the ultrasonic sensor works and how it can be programmed using Blockly. Higher: Challenging the students to try using colour sensor/gyroscope/touch sensor instead of ultrasonic sensor to achieve the same result	Classroom resources. Computers EV3 Classroom Google Classroom Lego EV3 sets

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Elaborate: Get the students to programme the robot to do additional actions as it detects an obstacle: beep louder, move slower or faster as the robot is getting closer to the obstacle. Get the students to reflect on their performance: what was easy/hard to implement and why.

Assessment

Teacher Observation Checklist

Scale:

Partially accomplished

Fully accomplished

Overachieved

Criteria to evaluate students' progress:

Students can use the Ultrasonic Sensor to detect an object.

Students can change the parameters of the Ultrasonic Sensor Blocks to detect different distances.

Students can expand their program to react dynamically to the detected distance.

Self-Assessment

Have each student choose the level that they feel best represents their performance.

End of the Unit Project: "Mission Impossible" Create a "mission impossible device" that is used to guard your treasure. Device is a trap that is activated by two sensors, touch sensor and ultrasonic sensor

Assessment and self-assessment:

Task: Your friends from other teams will be given 10 attempts to "steal" your treasure. Record attempts and efficiency of your device in a sheet.

Scale:

Platinum: None of the steal attempts succeed

Gold: More than half of the steal attempts fail

Silver: The device is constructed and programmed but needs further engineering for it to be effective

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	Bronze: Device is partially built		
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