**Westbrook School Department**

**Course Blueprint**

| **Content Area / Grade Level:** Science / 9, 10, 11, 12 | |
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| **Course Title**: Robotics | |
| **Course Description**  This semester course provides an introduction to the study of engineering concepts including physics, programming, mechanical systems, integration of sensors, team problem solving and engineering design methods. These core concepts are delivered with a robotics emphasis through relevant activities and projects using the Vex Robotics hardware and easy robotic programming software. Students taking this course should be comfortable communicating with peers. | |
| **Westbrook K-12 Learning Standards**   * Developing and Using Models * Constructing Explanations and Designing Solutions * Engaging in Argument from Evidence * Obtaining, Evaluating and Communicating Information | **Vision of the Graduate**   * A clear and effective communicator * A self-directed and lifelong learner * A creative and practical problem solver * A responsible and involved citizen * An integrative and informed thinker |
| **Expected Outcomes -** Expectations for students upon completion of the course.  Students will be able to:   * Use tools to design and construct unique solutions to problems using VEX robotics materials. * Document and explain their building process and daily progress. * Demonstrate an understanding of problems encountered and provide evidence for how they were solved. | |
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| **Core Units of Study -**   * + - * Unit 1: Intro to VEX       * Unit 2: Intro to Robotics       * Unit 3: Applications of Robotics | |

| **CORE UNIT # 1**  **Title:** Intro to VEX | |
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| **Westbrook Learning Standards**   * Developing and Using Models * Constructing Explanations and Designing Solutions * Obtaining, Evaluating and Communicating Information   **Vision of the Graduate**   * A self-directed and lifelong learner * A creative and practical problem solver * An integrative and informed thinker | **Content for this Unit:**   * Understanding the different types of materials and tools used in building with VEX * How gears work |
| **Performance Indicators (Skills)**  The students will be able to:   * Follow directions to build a functioning robot using a VEX tools. * Use gears to change the power/speed of a motor. | **Essential Questions**   * What is a building platform and why is it useful to be able to understand different styles? |
| **Common Assessment**   * Clawbot * Gearbox | |
| **Instructional Suggestions / Resources** -   * VEX Curriculum | **Assessment (formative) Suggestions/Resources**   * Openers * What is robotics? Email * Material identification worksheet * Gear reading |

| **CORE UNIT # 2**  **Title:** Intro to Robotics | |
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| **Westbrook Learning Standards**   * Developing and Using Models * Constructing Explanations and Designing Solutions * Engaging in Argument from Evidence * Obtaining, Evaluating and Communicating Information   **Vision of the Graduate**   * A clear and effective communicator * A self-directed and lifelong learner * A creative and practical problem solver * A responsible and involved citizen * An integrative and informed thinker | **Content for this Unit:**   * Writing directions * What automation is * Documenting problem solving |
| **Performance Indicators (Skills)**  The students will be able to:   * Document and explain their building process and daily progress. * Describe the impact of automation on society | **Essential Questions**   * How do you solve problems related to building? |
| **Common Assessment**   * Skys the Limit quick build * Driving Car * Robots in the workplace | |
| **Instructional Suggestions / Resources** -   * VEX Curriculum | **Assessment (formative) Suggestions/Resources**   * Writing Directions * News articles |

| **CORE UNIT #3**  **Title:** Applications of Robotics | |
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| **Westbrook Learning Standards**   * Developing and Using Models * Constructing Explanations and Designing Solutions * Engaging in Argument from Evidence * Obtaining, Evaluating and Communicating Information   **Vision of the Graduate**   * A clear and effective communicator * A self-directed and lifelong learner * A creative and practical problem solver * A responsible and involved citizen * An integrative and informed thinker | **Content for this Unit:**   * How automation affects career choices * Designing solutions * Teamwork |
| **Performance Indicators (Skills)**  The students will be able to:   * Design solutions for real world robotic problems * Understand the impact of automation on their future career decisions | **Essential Questions**   * How do you collaboratively create designs to solve problems? |
| **Common Assessment**   * Push or pull bot * Ethical vs Logistical * Sumobot final | |
| **Instructional Suggestions / Resources** -   * VEX curriculum | **Assessment (formative) Suggestions/Resources**   * News Articles |