| SUBJECT: Robotics | GRADE: 9-12 |
|---|---|
| **Unit Title: Basic Programming: Input and Output** | **Time Frame: Days 1-12** |
| **UNIT OVERVIEW** | |
| This unit explores the basic programming concepts and syntax necessary for input. Output will be through the LCD on the brain | |
| **LRG SKILLS AND DISPOSITIONS** | **PA STANDARDS** |
| Critical Thinking and Problem Solving: Introduction to Coding (S4C) | 3.5.9-12.A<br>3.5.9-12.K (ETS)<br>3.5.9-12.Z<br>3.5.9-12.CC<br>3.5.9-12.II |
| **COMPETENCIES** | **LEARNING TARGETS** |
| I can code a program to express an idea or solve a problem. | • I can write a program that causes output to the LCD.<br>• I can write a program that uses the LCD to output correct information based upon parameters given by the instructor. |
| I can use best practices while programming. | • I can write a program using correct syntax |

| SUBJECT: Robotics | GRADE: 9-12 |
|---|---|
| **Unit Title: Dead Reckoning** | **Time Frame: Days 13 - 30** |
| **UNIT OVERVIEW** | |
| This unit explores the use of Dead Reckoning to navigate the robot | |
| **LRG SKILLS AND DISPOSITIONS** | **PA STANDARDS** |
| Critical Thinking and Problem Solving: Basic Navigation (S4C) | 3.5.9-12.A<br>3.5.9-12.K (ETS)<br>3.5.9-12.Z |

| | |
|---|---|
| | 3.5.9-12.CC<br>3.5.9-12.II |
| **COMPETENCIES** | **LEARNING TARGETS** |
| I can code a program to express an idea or solve a problem. | • I can write a program that will navigate the robot through a predefined course correctly.<br>• I can correctly add components to my program as new motors are added to the robot. |
| I can demonstrate an understanding of many digital devices | • I can make adjustments to my program to compensate for inconsistencies in the mechanical parts of my robot.<br>• I can correctly install the mechanical arm to the robot chassis.<br>• I can make adjustments to my arm and claw motors so that they move and grip with the correct pressures/degrees. |
| I can approach a challenge with computational thinking. | • I can describe why Dead Reckoning is not a fool-proof way of programming a robot to accomplish a task. |

| **SUBJECT: Robotics** | **GRADE: 9-12** |
|---|---|
| **Unit Title: Using sensors for input to control the output of the robot** | **Time Frame: Days 31 - 70** |
| **UNIT OVERVIEW** | |
| This unit explores the use of sensors to assist with the navigation of the robot | |
| **LRG SKILLS AND DISPOSITIONS** | **PA STANDARDS** |
| Problem Solving: Advances Motio Critical and Thinking (S4C) | 3.5.9-12.A<br>3.5.9-12.K (ETS)<br>3.5.9-12.Z<br>3.5.9-12.CC<br>3.5.9-12.II |

| COMPETENCIES | LEARNING TARGETS |
|---|---|
| I can demonstrate an understanding of many digital devices. | • I can build a conveyor system to use in the “basketball challenge” which uses sensors to activate the conveyors and allow my teammates and I to complete the challenge as quickly as possible. |
| I can code a program to express an idea or solve a problem. | • I can write a program that utilizes the inertial sensor in the turning of the robot and affect output.<br>• I can write a program that utilizes the distance sensor to navigate the robot and affect output.<br>• I can write a program that utilizes the color sensor to navigate the robot and affect output.<br>• I can write a program that utilizes the “timeout” function to assist with the completion of a program.<br>• I can write a program that utilizes the bumper-switch to assist with the navigation of the robot. |

| **SUBJECT: Robotics** | **GRADE: 9-12** |
|---|---|
| **Unit Title: Advanced robotics Challenge** | **Time Frame: Days 71-90** |
| **UNIT OVERVIEW** | |
| This unit explores the use of “Expert” programming mode in Vexcode Pro to fine-tune the code for competition | |
| **LRG SKILLS AND DISPOSITIONS** | **PA STANDARDS** |
| Critical Thinking and Problem Solving: Classroom Competitoin Challenge (S4C) | 3.5.9-12.A<br>3.5.9-12.K (ETS)<br>3.5.9-12.Z<br>3.5.9-12.CC<br>3.5.9-12.II |
| **COMPETENCIES** | **LEARNING TARGETS** |

| | |
|---|---|
| I can code a program to express an idea or solve a problem. | • I can build a robot and write a program that will allow me to navigate a robotics challenge course as quickly and as efficiently as possible. |
| I can use best practices while programming. | • I can write a program in which I switch to “expert” mode and then make modification to the robot.config file. The changes should customize the robot to fit my driving skills. |