

**PBL Project or Activity Title**

PCS Edventures – Intro to Robotics

**Site Name: Grace Place at GGHS**

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| **Grade Level & # of Students:**   Tues – 20 9th, 20 10th  Weds – 20 11th/12th | Week of 3/26, 3/27 | Week of 4/2, 4/3 | Week of 4/9, 4/10 | Week of 4/16, 4/17 |
| **Daily Learning Objective:** | Students will be able to:  State value of several STEM careers related to robotics  Perform Journaling at basic level  State some characteristics of the Robot’s controller (Brain)  Describe what programming using graphical image looks like  Understand that programming graphical images linked together in a sequence makes a robot behave in a certain way  Describe where programs are developed and compiled and how they are uploaded to the “brain”  Describe what makes DC motors change directions and speed. | Students will be able to:  State how to use the Cortex software to write some simple programs to control motors  State some motor control commands to have the motor do different things  State how to compile and upload programs to controller  Understand how to build a motor testing station  Understand how to execute programs and see and journal results | Students will be able to:  Use more sophisticated motor control programs to become more proficient in software and motor control.  Understand how various components are put together to make a robot. | Students will be able to:  Understand how to physically build a robot  Know and demonstrate additional software commands and how to use them to write simple programs to control a robot beyond just motor control without sensor input. |
| **Habit in Action:** | The Leader In Me Habit  # 1 | 2 | 3 | 4 | 5 | 6 | 7  **(2) Begin with End in Mind/ (3) Put 1st Things 1st** = students are able to understand and follow directions for putting together a robot  **(6) Synergize/ (7) Sharpen the Saw** = students are working together toward a common goal and hopefully enjoying that time together | The Leader In Me Habit  # 1 | 2 | 3 | 4 | 5 | 6 | 7  **(2) Begin with End in Mind/ (3) Put 1st Things 1st** = students are able to understand and follow directions for putting together a robot  **(6) Synergize/ (7) Sharpen the Saw** = students are working together toward a common goal and hopefully enjoying that time together | The Leader In Me Habit  # 1 | 2 | 3 | 4 | 5 | 6 | 7  **(2) Begin with End in Mind/ (3) Put 1st Things 1st** = students are able to understand and follow directions for putting together a robot  **(6) Synergize/ (7) Sharpen the Saw** = students are working together toward a common goal and hopefully enjoying that time together | The Leader In Me Habit  # 1 | 2 | 3 | 4 | 5 | 6 | 7  **(2) Begin with End in Mind/ (3) Put 1st Things 1st** = students are able to understand and follow directions for putting together a robot  **(6) Synergize/ (7) Sharpen the Saw** = students are working together toward a common goal and hopefully enjoying that time together |
| **Subject Area:** | Engineering/Technology | Engineering/Technology | Engineering/Technology | Engineering/Technology |
| **Florida Standards:**  **MAFS/LAFS/SS/SC** | CTE-TECED.68.ROBTEC.03  Identify the basic subsystems on a robotic system | CTE-TECED.68.ROBTEC.02  Demonstrate an understanding of basic programming concepts | CTE-TECED.68.ROBTEC.02  Demonstrate an understanding of basic programming concepts  CTE-TECED.68.ROBTEC.03  Identify the basic subsystems on a robotic system  CTE-TECED.68.ROBTEC.05  Build, program, and configure a robot to perform predefined tasks. | CTE-TECED.68.ROBTEC.02  Demonstrate an understanding of basic programming concepts  CTE-TECED.68.ROBTEC.03  Identify the basic subsystems on a robotic system  CTE-TECED.68.ROBTEC.05  Build, program, and configure a robot to perform predefined tasks. |
| **PBL Assignment Overview/ Activity Description :** | See objectives.  Activities include:  Demo Cortext software on laptop and tablet to create, compile, and upload programs to demo controlling motors (e.g. Run for set time, run as different speed and direction, have motors do all this by simply tilting the tablet in different directions.  Demo controlling motors using snap circuits and a voltmeter to show that what the computer id doing is controlling voltage and polarity to change speed and direction | See objectives.  Activities include:  Students will to Cortex software to write some simple programs to control motors  Students will use various motor control commands to have the motors do different things  Students will compile and upload programs to controller  Students will build a motor testing station  Students will execute various programs and see and journal results | See objectives.  Activities include:  Student will write and test more sophisticated motor control programs to become more proficient in software and motor control.  Students will start construction of a Robot to understand how various component work together. | See objectives.  Activities include:  Student will finish robot construction, thus understanding how to physically build a robot  Write simple programs to run robot to do certain tasks |
| **Resources/Materials:** | * Intro to Robotics week 1 presentation and laptop projector * Intro to Robotics week 1 handout to students * Journal sheet handout for an example and for the student to use. * Connection to internet to show videos of HS students involved in robotics competitions for student buy-in * Laptop computer with Cortex software and Bluetooth for demos * Assembled motor station kit from PCS Edventures for demo * Tablet with Accelerometer Cortext software to demo to generate student excitement * Snap Circuits kit and Voltment to show how DC motor speed is proportional to voltage and motor rotation direction is based on polarity. | * Intro to Robotics week 2 presentation and laptop projector * Intro to Robotics week 2 handout to students * Journal sheet handout for the student to use. * Laptop computer with Cortex software and Bluetooth * Assembled motor station kit from PCS Edventures for software testing * Edventures kit parts for students to build their own motor control station | * Intro to Robotics week 3 presentation and laptop projector * Intro to Robotics week 3 handout to students * Journal sheet handout for the student to use. * Laptop computer with Cortex software and Bluetooth * Assembled motor station kit from PCS Edventures for software testing * Edventures kit parts for students to start building their own robot | * Intro to Robotics week 3 presentation and laptop projector * Intro to Robotics week 3 handout to students * Journal sheet handout for the student to use. * Laptop computer with Cortex software and Bluetooth * Assembled motor station kit from PCS Edventures for software testing * Edventures kit parts for students to complete their own robot |
| **Assessment/Evaluation:** | Teachers assess student knowledge based on 1:1 interaction with questions and to written journal reflections. | Teachers assess student knowledge based on 1:1 interaction with questions and to written journal reflections. | Teachers assess student knowledge based on 1:1 interaction with questions and to written journal reflections.. | Teachers assess student knowledge based on 1:1 interaction with questions and to written journal reflections. |