

ASSIST LESSON PLAN

<p>Description: In this project students will use a variety of 21st century skills to plan a project, prepare and present a lesson, work as a team, and learn basic programming skills using the Arduino platform. <i>*Note: this lesson is intended for a class where at least some of the students have programming experience.</i></p>	<p>Lesson Plan Tags:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> High School CTE <input checked="" type="checkbox"/> High School BFIT <input checked="" type="checkbox"/> High School Technology
<p>Introduction: In this lessons students will be given a project to complete in its entirety. To begin, the teacher will introduce the Arduino to the students using the video provided. The video will help engage the students' interest. After the video, a quick intro lesson to the Arduino will be given. Once the lesson is given, the project will be given to each team. In this project, the students will go through each step of the project life cycle to deliver a lesson to the class. In this lesson, the teams will learn basic programming skills, collaborate, problem solve, and work as a team.</p>	
<p>Curriculum Alignment:</p> <p>1.00 Understand project management as a concept and as a process (B2) 1.01 Understand the five processes of project management, individually and collectively (B2) 1.02 Interpret each of the core and facilitating functions associated with project management and the relationship between and among them (B2) 5.04 Apply appropriate methods to identify and assess potential risks as well as to plan appropriate risk responses (C3)</p>	
<p>Objectives:</p> <ul style="list-style-type: none"> • Students will learn the basics of using an Arduino. • Students will implement basic programming principles. • Students will experience the entire project life cycle. • Students will work as a team. • Students will use presentation, problem solving and critical thinking skills when creating and presenting their lesson plan. 	
<p>Time & Location:</p> <ul style="list-style-type: none"> • Lesson will take place in the classroom. • Lesson will take 3-5 80 minute block schedule class periods (depending on team and class size). 	<p>Safety:</p> <ul style="list-style-type: none"> • Maintain an orderly and safe environment for students to work. • Arduino safety with students: <ul style="list-style-type: none"> ○ Unplug Arduino when not in use. ○ Avoid touching ground and power wires. ○ Do not eat Arduino parts.
<p>Teacher Materials:</p> <ul style="list-style-type: none"> • Arduino Starter Kit (depending on class size) • Arduino PDF Starter Projects • Arduino Online Projects (if allowed to use login) 	<p>Student Materials:</p> <ul style="list-style-type: none"> • Google Drive Accounts • Computers
<p>Student Prior Knowledge:</p> <ul style="list-style-type: none"> • Students should understand the project life cycle. 	<p>Teacher Preparations:</p> <ul style="list-style-type: none"> • Students should be paired in groups where at least one student has some programming experience. • Teachers should have a basic understanding of the Arduino

Assessment:		Critical Vocabulary: <i>None</i>
<ul style="list-style-type: none"> • Project Plan Grading Rubric • Presentation Grading Rubric 		
Day	Activity	Notes
1	<ol style="list-style-type: none"> 1. Introduce the Arduino to the class using the video to grab the students' attention. 2. Take out the Arduino and the parts you have and review with the class. Show them the Arduino, and explain what all the ports do. See if the students have any questions. 3. Introduce the project scope statement (attached). When introducing the project make sure to explain the project in its entirety and answer any questions they have. Students should understand each deliverable. The main purpose of the project is utilize the project life cycle to plan, execute, monitor and close a project. They should see how each stage works. 4. After all questions are asked, pass out the Arduinos (4 people per Arduino) and allow students to familiarize themselves with the platform. Complete a class demonstration of the blinking light (20 minutes). 5. Students begin planning the project. The students will complete a Work Breakdown Structure to plan the project. The objective of the project is to learn the basics of the Arduino and teach the class. 	<p>**In this lesson you can use a real Arduino, or an Arduino simulator.</p> <ul style="list-style-type: none"> - Introduction to Arduino video from Make - Link - Arduino Blink Lesson - Link <p>Introduction to Arduino comic. Great introduction for the teacher or students: Link</p> <ul style="list-style-type: none"> - Work Breakdown Structure for Dummies - Arduino Parts
2	<ol style="list-style-type: none"> 1. Students will continue the planning process. Once they are complete they must get teacher approval to begin the execution process. 2. Once approved, the students can begin executing the project plan. 	
3	<ol style="list-style-type: none"> 1. Teacher will meet with the project manager of each group to monitor progress. 2. Students will continue the executing/monitoring and controlling stage. They should finish by today. 	
4	Presentations	
5	Presentations	
Author Information		
<i>In this section, tell us about yourself and your mentor! Include the following:</i>		
<p>Panagiotis Peter Styliadis Panther Creek High School, Wake County High School CTE (MSIA, SAS, Project Management) Full time teacher since 2014 pstyliadis@wcpss.net</p>	<p>Dr. Jur NC State University LEADER OF THRUST V Assistant Professor in the College of Textiles jsjur@ncsu.edu</p>	<p>Dr. Veety NC State University EDUCATION DIRECTOR Teaching Assistant Professor, Department of Electrical and Computer Engineering enicole@ncsu.edu</p>

ASSIST LESSON PLAN

ARDUINO PROJECT SCOPE STATEMENT

BUSINESS NEED

Programming is a very important part of the 21st century workforce. In 2013 President Obama believed that seeing curriculum requiring American high schools to learn programming “makes sense”. Programming is become the basic literacy in the digital age and should be learned by all at a young age. There are many different types of programming languages, but they basic concept is similar. You are telling a computer “to do” something for you.

Mr. Styliadis believes in bringing programming to the classroom. Today we will be learning to program an Arduino Uno to complete a task for us. After you learn the task you will teach it to the class. Working as a member of a team, conduct web-based research on the Arduino platform to understand what it is and how it works. After you conduct your research, you will plan to execute a lesson to the class. Your team will begin by picking an Arduino project from the starter kit. After you pick your project you will complete a plan to begin to organize your scope, roles and responsibilities.

PROJECT OVERVIEW

[Please enter your project overview here. Be specific in explaining what your plans are for the class.]

PROJECT OBJECTIVES

- Provide a lesson plan that will last 20 minutes.
 - Should include a hands on activity.
 - Explains what the Arduino does.
 - Basics of an Arduino.
 - Hands on Demonstration of your Arduino Project.
 - Explain the lines of code used and what they do.
 - Provide a small assessment at the end (5 questions).
 - While teaching the class, all members should be involved in the process.

PROJECT CUSTOMER, PROJECT SPONSOR AND PROJECT MANAGER

	<i>Name</i>	<i>Organization</i>
Project Sponsor	Mr. Styliadis	Panther Creek High School
Project Manager	[Enter Name]	Panther Creek High School
Project Team	[Enter Names]	Panther Creek High School

DELIVERABLES (what you will turn in)

- Completed Project Scope Statement
- 20 Minute Official Lesson Plan
- Group Daily Log

- You will create an oral presentation about the basics of the Arduino, and your specific Arduino project using any software you choose (PowerPoint, Prezi, PowToons, Infographics, etc.).
- You will create a minimum 5 question formal assessment for the class.

MILESTONES (Here are some basic milestones that must be included. You can add more if necessary)

<i>Milestones</i>	<i>Estimated Completion Timeframe</i>

REQUIREMENTS

- 20 Minute Lesson.
- Maintain a safe and orderly classroom.
- All group members must participate.

PROJECT BOUNDARIES

In Scope

- Quiz
- Hands on activities.

Out of Scope

- Homework assignment.

CRITICAL SUCCESS FACTORS

[What are some critical success factors for your project?]

ASSUMPTIONS

[What are assumptions you must be wary of?]

CONSTRAINTS

[What are some constraints?]

ASSIST LESSON PLAN

Group Name: _____ Group Number: _____

SPEAKING SKILLS	<i>All elements present</i>	<i>Most elements present</i>	<i>Some elements present</i>	<i>No elements present</i>
Delivery (Presenters doesn't rush, shows enthusiasm, avoids <i>likes, ums, kind ofs, you knows, etc.</i> Uses complete sentences.)	4	3	2	1
Eye Contact (Presenters keeps head up, does not read, and speaks to whole audience.)	4	3	2	1
Posture (Presenters stands up straight, faces audience, and doesn't fidget.)	4	3	2	1
Volume (Presenters can be easily heard by all. No gum, etc)	4	3	2	1
CONTENT	<i>All elements present</i>	<i>Most elements present</i>	<i>Some elements present</i>	<i>No elements present</i>
Introduction				
a. Presentation begins with a clear focus/thesis, title, table of contents.	4	3	2	1
b. Introduction of team and roles.	4	3	2	1
Topic Development				
a. Presentation includes all elements previously determined by the teacher.	6	4	2	0
b. Presentation is clearly organized. (Material is logically sequenced, related to thesis, and not repetitive.). Slides are not overwhelming.	4	3	2	1
c. Presentation shows full grasp and understanding of the material with all team members.	4	3	2	1
d. Presentation uses well produced audio/visual aids or media to enhance understanding of findings, reasoning, and evidence, and to add interest.	4	3	2	1
Conclusion				
a. Presentation highlights key ideas, transitions smoothly to ending, reviews presentation and concludes with a strong final statement.	4	3	2	1
b. Presenters fields questions easily.	4	3	2	1
c. All students are participating.	4	3	2	1

GENERAL COMMENTS:

POINTS: /50