RAMPED – Summer 2016

Arduino Lesson Plan

Mance Hurley

P = Pretest (think essential questions)
O = Objectives (measurable - see Bloom's taxonomy)
C = Catch (hook, anticipatory set, etc... use different senses, not a question)
A = Activity (procedure of what the students should do)
R = Review (how will students go over what they've learned?)
A = Assessment (formative and/or summative)
P = Posttest (same as pretest for comparison purposes)
S = Standards (Wyoming, NGSS, etc...) showcasing crosscutting concepts[1]

<table>
<tr><td>Pretest Questions</td><td>What is an Arduino and how can it be used to control a robot?</td></tr>
<tr><td>Objectives</td><td>Students will use an Arduino and program it and add the necessary hardware to operate a robot in their Pathways course to 100% success.</td></tr>
<tr><td>Catch</td><td>The Beast</td></tr>
<tr><td>Activity</td><td>Provide teams of students with an Arduino uno starter kit and a box of sensors, and salvaged RC car and robot parts they can use to create a robot that can;
automatically follow a line
automatically stop before it moves into a obstacle
can be controlled with a TV remote.
The engineering design process must be followed and all design details and sketches must be recorded in an engineering note book.</td></tr>
<tr><td>Review</td><td>What was good about your design?
What would you do differently?</td></tr>
<tr><td>Assessments</td><td>TEAM Rubric; did the engineering note book match the project tha was designed 4 3 2 1

<table><tr><td>Did the</td><td>4
Yes</td><td>3
Very</td><td>2
Kinda</td><td>1
Not so</td></tr></table></td></tr>
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[1] http://ngss.nsta.org/CrosscuttingConceptsFull.aspx

See Career & Vocational Education PLDs – Performance Level Descriptors

4 Advanced Performance
3 Proficient Performance
2 Basic Performance
1 Below Basic Performance

design meet all the design criteria		nearly		much
Did the information in the Engineering note book follow the design process and match the project?	4 Yes	3 Very nearly	2 Kinda	1 Not so much
Did the robot complete the task	4 Yes	3 Very nearly	2 Kinda	1 Not so much

Individual Rubric

CV12.2.1	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.2.2	4 Met	3 Nearly met	2 Kinda Met	1 Did not

				meet
CV12.2.3	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.2.4	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.4.1	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.4.2	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.4.3	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.4.4	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.5.1	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.5.2	4 Met	3 Nearly met	2 Kinda Met	1 Did not meet
CV12.5.3	4 Met	3 Nearly	2 Kinda	1 Did

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<tr><td></td><td>
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<tr><td></td><td></td><td>met</td><td>Met</td><td>not meet</td></tr>
<tr><td>CV12.5.4</td><td>4
Met</td><td>3
Nearly met</td><td>2
Kinda Met</td><td>1
Did not meet</td></tr>
</table>
</td></tr>
<tr><td>Posttest Questions
(same as pretest questions)</td><td>What is an Arduino and how can it be used to control a robot?</td></tr>
<tr><td>Standards
Wyoming Career and Vocational Standards</td><td>WYCVE Standard 2 Communication and Collaboration
CV12.2.1
CV12.2.2
CV12.2.3
CV12.2.4
WYCVE Standard 4 Technical Literacy
CV12.4.1
CV12.4.2
CV12.4.3
CV12.4.4
WYCVE Standard 5 Technical Proficiency and Productivity
CV12.5.1
CV12.5.2
CV12.5.3
CV12.5.4</td></tr>
<tr><td>Crosscutting Concepts from NGSS</td><td>2 Cause and Effect
3 Scale, Proportion, and Quantity</td></tr>
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