



Internet of Things (IoT) at UCF



UNIVERSITY OF CENTRAL FLORIDA

*UCF RET Site: Collaborative Multidisciplinary
Engineering Design Experiences for Teachers*

2003320: Physical Science Honors

Erika Trnka

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READ THIS FIRST

- Write all lessons and activities in present tense.
- Be aware of copyright issues for images. Images used must be your own or in the public domain. It is easiest to use your own images. If using a public domain image you must document the source. Please note that images obtained from a google search are NOT public domain images.
- These lessons will be published. All work should be your own. Be sure to cite references where appropriate and only use images in the public domain/creative commons or that you develop. All lessons will be run through turnitin.com prior to publication.
- Remember to do your 3R reflection include an updated copy of your lesson plan, developed assessment tools, presentation materials, to the evaluator. See implementation plan instructions developed by the evaluator. Send within a week after completing the lesson to bonnie.swan@ucf.edu

RET Site: CoMET Lesson/Unit Plan

Course(s): 2003320

Grade Level: 8

Suggested Length of Lesson:

Materials/Technology Needed <ul style="list-style-type: none"> ▪ Carbon nanotube sensors ▪ Multimeter 	Where this Fits <ul style="list-style-type: none"> ▪ This lesson fits inside of my electricity unit during the second nine weeks of the school year.
Lesson Objective(s)/Learning Goal(s) <ul style="list-style-type: none"> ▪ Students will be able to solve problems using Ohm's Law. ▪ Students will be able to use the Ohm's Law formula to calculate resistance ▪ Students will be able to describe the differences between conductors, semi-conductors, and insulators, and give examples of each. 	Standard(s)/Benchmark(s) Addressed <ul style="list-style-type: none"> ▪ <i>Standards:</i> <ul style="list-style-type: none"> – SC.912.P.10.14 – Differentiate among conductors, semiconductors, and insulators. – SC.912.P.10.18 – Investigate and explain the relationships among current, voltage, resistance, and power.
Standards for Mathematical Practice <ul style="list-style-type: none"> ▪ Multiplication and division 	Instructional Strategies <ul style="list-style-type: none"> ▪ Direct instruction ▪ Random selection ▪ Guided Practice ▪ Cooperative learning ▪ Independent practice
Evidence of Learning (Assessment Plan) <ul style="list-style-type: none"> ▪ Formative assessments include reading daily bell work answers, exit slips, monitoring student discourse, and asking students questions orally ▪ Summative assessments include a post-test to measure standards-based learning. The post-test will be the same as the pre-test in order to get the most complete picture of student learning gains. 	
Description of Lesson Activity/Experiences <ol style="list-style-type: none"> 1. Day 1: Students will complete a bell work assignment, take the pre-test, and begin taking notes on Ohm's Law. 2. Day 2: Students will complete a bell work assignment, finish their notes on Ohm's Law, and solve some math problems using Ohm's Law. 3. Day 3: Students will complete a bell work assignment and build series circuits. 4. Day 4: Students will complete a bell work assignment, and take notes on the differences between series and parallel circuits. Real life examples will be discussed. 5. Day 5: Students will complete a bell work assignment, build parallel circuits, and discuss conductors. 6. Day 6: Students will complete a bell work assignment, then draw a Venn diagram comparing conductors, semi-conductors, and insulators. Carbon Nanotubes will be introduced. 7. Day 7: Students will complete a bell work assignment, and formulate ideas about the potential uses for carbon nanotubes. Strain sensors will be introduced. 	

8. Day 8: Students will complete a bell work assignment. Students will experiment with strain sensors, and calculate the resistance of strain sensors in different states.
9. Day 9: Students will complete a bell work assignment. Students will then play a Jeopardy review game to prepare for the summative assessment.
10. Day 10: The summative assessment will be administered.

Recommended Assessment(s) and Steps

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List of Materials/Resources Used

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You can create multiple lesson plans if you are developing a unit.

Important Vocabulary

Define unusual or probably unknown words. Write definitions in sentence format.

Term	Definition
Carbon Nanotube	An allotrope of carbon with higher conductivity and lower density than metals
Conductor	A substance that readily transfers electricity, usually metal
Current	The flow of electrons in the wire
Insulator	A substance that does not readily allow for the transfer of electricity
Multi Meter	A device that can measure many different things, such as voltage and Ohms
Ohm's Law	A formula that give the relationship between voltage, current, and resistance
Parallel Circuit	A circuit in which the energy can flow in two or more paths
Power	Volts X current
Resistance	Objects that cause the current to slow
Semi-Conductor	A substance that partially conducts electricity
Series Circuit	A circuit in which the energy flows in only one path
Strain Sensor	A type of sensor that measure the distortion of an object that is loaded
Voltage	The amount of energy in a circuit

Troubleshooting Tips

Add anything helpful here.

Other Helpful Information

Add anything helpful here.

Attachments

List here any lesson or activity attachments not included within this document, such as the following:

- PowerPoints for lecture
- Handouts (Worksheets, Activities, Quizzes, Visual Aids, etc).
- Answer Keys
- Coding

Remember to send these as separate files along with your unit/lesson plan.

References

List here using APA format

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