# Journey Middle School

*217 Celtic Drive, Madison, Alabama 35758*

## Magic of Electrons, 7th & 8th grade

## Ms. Kelly Brunson

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| **Teacher Contact Information** | **Email:** vkbrunson@madisoncity.k12.al.us<br>**Classroom Phone:** (256) 774-4695 ext. 84320 |
| **Classroom Digital Platforms** | **Webpage Link:** https://www.madisoncity.k12.al.us/Page/8265<br>**Schoology Link:** https://madisoncity.schoology.com/home<br>**Distribution List Link:** https://forms.gle/21BqSqVb9oPDqQ886 |
| **Textbook Information** | Online PLTW curriculum (no textbook) www.pltw.org (login information provided in class) |
| **Course Description** | In this class, students examine the behavior and parts of atoms as well as the impact of electricity on the world around them. They learn skills in basic circuitry design and use what they know to propose authentic designs. |
| **Course Objectives** | At the conclusion of this class, students will be able to confidently design simple circuits to address authentic challenges. |
| **Prerequisites** | None |
| **Course Goals** | • Understand Atomic Structure<br>• Differentiate Conductors and Insulators<br>• Compare Static and Current Electricity<br>• Build and Test Electromagnets<br>• Construct and Analyze a DC Motor<br>• Design Basic Circuits<br>• Utilize Electronic Components<br>• Calculate Resistance and Apply Ohm's Law<br>• Understand Capacitors and Compare with Batteries<br>• Learn Binary Number Systems and Logic Gates |
| **Instructional Delivery Plan, Course Outline & Culminating Project (Course Outline)** | **Unit 1: What is Electricity?**<br>*This lesson is an introduction to basic electricity. No prior knowledge of the concepts within the lesson is assumed. The power provided through electricity is a part of our everyday lives. Few people could imagine life without it, but few consider where it comes from or how it is produced and transmitted. This lesson will show the difference between a conductor and an insulator. This knowledge will be applied by measuring current, voltage, and resistance. The concept of converting energy into electricity will be explored through the designing and building of electromagnet models, a DC motor, and a generator.*<br><br>**Unit 2: Electronics**<br>*This lesson is an overview and introduction to basic electronics and circuits with a focus on some of the most basic devices and their functions. Students will be introduced to electrical circuit diagrams and asked to create them. In this lesson students will observe how the electron flow merges with technology through electronic circuits. Almost any device that uses electricity can be broken down into basic electronic circuits and the electronic devices in those circuits.* |

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| | *This lesson will bridge the gap between Lesson 1 What Is Electricity? where students learned about how electrons flow as well as obtain the knowledge needed to go from electric flow through simple circuits and Lesson 3 Digital Electronics where students will see how electronic devices, especially the transistor, are used to create integrated circuit chips that function based on logic.*<br><br>**Unit 3: Digital Electronics**<br>*This lesson introduces students to the digital world of cell phones, computers, MP3 devices, and many other modern conveniences that rely on binary numbers, the 0s and 1s of the digital realm, to function. This is an exciting field for students to consider because it is ever-changing. An understanding of the components and their functions opens the door for limitless creative ideas to design improved devices that can entertain or save lives.*<br><br>**Culminating Project: 3.4 Logic Problems**<br>*Students design, build, and test circuits to simulate devices that will solve one of nine everyday problems, such as a smoke alarm, burglar alarm, or an automatic emergency shut-off switch.* |
| **Credentialing** | **None** |
| **CTSO Integration**<br>***(JMS Career Technical Student Organization is TSA)*** | Technology Student Association, TSA, is a **career technical student organization** and a fundamental part of this course. It is a national career and technical student organization of students engaged in science, technology, engineering, and mathematics (STEM). TSA is integrated into the program which includes competitions and leadership opportunities. TSA provides students with activities during their class time and after school with our local TSA Chapter. |
| **Embedded Numeracy Anchor Assignment** | **Assignment:** Unit 2 Lesson 3 (Resistance - Resistor Practice Table)<br>**Standard:** MA19.6.6 Add, subtract, multiply, and divide decimals using a standard algorithm. |
| **Embedded Literacy Anchor Assignment** | **Assignment:** Unit 3 Lesson 6 (Logic Problems Data Sheet)<br>**Standard:** ELA21.7.7b - Write informative or explanatory texts with an organized structure and a formal style to examine ideas or processes effectively while developing the topic and utilizing appropriate transitions, precise vocabulary, and credible information or data when relevant. |
| **Embedded Science Anchor Assignment** | **Assignment:** Unit 1 Lesson 1 (Atomic Structure and Electricity)<br>**Standard:** SC15.8.1 Analyze patterns within the periodic table to construct models (e.g., molecular-level models, including drawings; computer representations) that illustrate the structure, composition, and characteristics of atoms and molecules. |
| **CTE Lab Safety Guidelines** | Each student in a CTE/PLTW course will be required to complete a lab safety exam and score 100% correct before being allowed to use any tools on projects. We expect students to responsibly and safely use the CTE equipment. Examples of equipment used in CTE courses may include and are not limited to the following: scissors, hot glue guns, box cutters, power tools, hand tools, measuring tools, electronic equipment, computers, medical supplies, adhesives, robotics equipment, food items (consumable and non-consumable). |
| **Classroom Expectations** | Classroom Expectations:<br>1. Come prepared to learn everyday and follow all directions quickly.<br>2. Try to limit your time outside of the classroom as much as you can.<br>3. Try your very best every single day.<br>4. Be kind and respectful to everyone.<br>5. Keep your area clean<br>6. Keep all personal electronics out of sight during class |
| **Progressive Discipline** | **All progressive discipline will correspond with the Madison City Schools Code of Conduct** |

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| ***(JMS Policy)*** | **regarding Class I and II offenses. Class III offenses are a direct office referral.**<br><br>● Warning<br>● Conference with student with parent notification<br>● Parent Contact<br>● Detention<br>● Referral to administration for repeat Class I violations and initial Class II and III offenses---Consequences determined to be reasonable and appropriate by the school administration. |
| **Cell Phone Policy** | |
| **Grading Policy**<br>***(MCS Policy)*** | **60%** = Assessments (Tests, Essays, Projects)<br>**40%** = Daily Grades (Quizzes, Homework, Classwork, and Participation) |
| **Late Work Policy** | ● Late work in CTE/STEM classes will not be accepted due to the brief nature of the classes. Students are expected to follow up with teachers upon return from an excused absence.<br>● Students present in class on the day of instruction are expected to turn in all in-class and out-of-class assignments on time. |
| **Make-up Work/Test Policy** | Under normal circumstances, it is expected that students will submit previously assigned work upon return to school after an excused absence. All work missed on the day(s) of excused absences must be made up within a timeframe determined by the teacher**. It is the responsibility of the student to ensure he or she makes up work following excused absences. Students will not receive credit for and will not be allowed to make up any assignments, tests, work, activities, etc., missed during unexcused absences.** |
| **Technology** | Student laptops should not be hard-wired to the network or have print capabilities. Use of discs, flash drives, jump drives, or other USB devices will not be allowed on Madison City computers. Neither the teacher nor the school is responsible for broken, stolen, or lost laptops. Laptops and other electronic devices will be used at the individual discretion of the teacher. |
| **Accommodations** | Requests for accommodations for this course or any school event are welcomed from students and parents. |
| **Materials & Supplies** | ● Chromebook<br>● Pencils<br>● Composition book OR notebook (graphing preferred)<br>● Wired headphones/earbuds<br><br>*Students will be completing hands-on projects during this class. If additional materials are needed the teacher will notify students and parents prior to the start of the project. |
| **Homework** | All assignments and projects will be completed during class time. In the case that a student may not utilize time wisely or are absent from class they may be expected to complete this work at home. |
| **Parent & Student Acknowledgment Form** | https://forms.gle/fNAWKrh5de5ka7bb6 |