



Journey Middle School

217 Celtic Drive, Madison, Alabama 35758

Computer Science for Innovators and Makers


6th, 7th, & 8th Grade

Ms. Kelly Brunson

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Classroom Digital Platforms	Webpage Link: https://www.madisoncity.k12.al.us/Domain/2882 Schoology Link: https://madisoncity.schoology.com/home Coding: https://makecode.microbit.org/ Curriculum: www.pltw.org Distribution List Link: https://forms.gle/21BqSqVb9oPDqQ886
Textbook Information	Online PLTW curriculum (no textbook) www.pltw.org (login information provided in class)
Course Description	Computer Science for Innovators and Makers teaches students that programming goes beyond the virtual world into the physical world. Students are challenged to creatively use sensors and actuators to develop systems that interact with their environment. Designing algorithms and using computational thinking practices, they code and upload programs to microcontrollers that perform a variety of authentic tasks. CSIM broadens students' understanding of computer science concepts through application.
Prerequisites	None
Course Objectives	<ul style="list-style-type: none"> ● Apply computational thinking to solve problems. ● Recognize that computational thinking can be applied in multiple disciplines. ● Choose appropriate computational practices when solving a problem. ● Analyze and create algorithms. ● Analyze the structure and functionality of a program. ● Create programs by developing and testing code in a modular, incremental approach. ● Adapt or improve existing code. ● Describe the hardware components of an electronic device and how they interact with software and the environment. ● Analyze the implications of computing in society. ● Consider accessibility and equity when designing products, creating solutions, and collaborating with others. ● Describe the role, connections between disciplines, and the impact of engineering and computer science on society.
Course Goals	Students Will: <ol style="list-style-type: none"> 1. Be able to follow the engineering design process 2. Learn and use standard safety practices. 3. Create algorithms and document the planning process for code 4. Demonstrate proper Troubleshooting and Code Tracing techniques 5. Design projects that meet consumer needs in today's world 6. Use sensors and actuators and inputs and outputs in projects 7. Create code and download programs to the micro:bit microcontroller

<p>Instructional Delivery Plan, Course Outline & Culminating Project (Course Outline)</p>	<p>Unit 1: BLINK (<i>The Blink Unit Project</i>) <i>Students explore the capabilities of physical computing systems. They learn to use algorithmic thinking as they prepare to code. Students use block-based coding on the makecode micro bit website to create and download programs to the micro bit microcontroller. They learn processes and gain skills to debug programs starting with pre-bugged programs. They apply these skills to their own project where they code a blinking message.</i></p> <p>Unit 2: THE INS & OUTS (<i>Secrets & Safes Unit Project</i>) <i>Students explore a variety of sensors and actuators to use as inputs and outputs in physical computing projects. Using different materials to transfer electrical signals, such as conductive thread, alligator clips, conductive paint, and copper tape. Students create their own input device - a sensor to switch - to interact with a program they develop on the microcontroller. They use these skills in the Secrets & Safes project to design, develop, and program a system to protect an object.</i></p> <p>Unit 3: PROGRAMMING THE PHYSICAL WORLD (<i>Interactions Unit Project</i>) <i>Students become innovators and makers. They apply their physical computing knowledge and skills and design one of three problem options: A wearable safety device, an engaging art installation, or a useful mechanical dispenser. Students will collaborate to create a design plan, code and final project.</i></p>
<p>Credentialing</p>	<p>None</p>
<p>CTSO Integration (JMS Career Technical Student Organization is TSA)</p>	<p>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. <i>TSA Based Activities relevant to CSIM include but are not limited to: Lab Safety Posters, Coding Challenges, Career Prep, Cyber Security, Essays on Technology, Challenging Tech Issues</i></p>
<p>Embedded Numeracy Anchor Assignment (Secrets & Safes Unit 2 Project)</p> <p>https://docs.google.com/document/d/1iGm-Oaalo899btVd44N4ZxLZu1O2u8qrRgahNXeKHdM/edit?usp=sharing</p>	<ul style="list-style-type: none"> • Make sense of problems and persevere in solving them. These students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. These students consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. • Use appropriate tools strategically. Mathematically proficient students consider available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and the tools' limitations. • Attend to precision. These students try to communicate mathematical ideas and concepts precisely. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. Mathematically proficient students are careful about specifying units of measure and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, and express numerical answers with a degree of precision appropriate for the problem context. • Solve multi-step real-world and mathematical problems involving rational numbers (integers, signed fractions and decimals), converting between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies. • Solve real-world and mathematical problems involving area, volume, and surface area of two- and three dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right rectangular prisms.

<p>Embedded Literacy Anchor Assignment (Secrets & Safes Unit 2 Project)</p> <p>https://docs.google.com/document/d/1iGm-Qaalo899htVd44N4ZxLZu1O2u8qrRgahNXeKHdM/edit?usp=sharing</p>	<ul style="list-style-type: none"> ● R1. Utilize active listening skills during discussion and conversation in pairs, small groups, or whole-class settings, following agreed-upon rules for participation. ● R3. Use digital and electronic tools appropriately, safely, and ethically when researching and writing, both individually and collaboratively. ● Expression: 7. Produce clear, coherent narrative, argument, and informative/explanatory writing in which the development, organization, style, and tone are relevant to task, purpose, and audience, using an appropriate command of language. ● b. Write informative or explanatory texts with an organized structure and a formal style, incorporating a focused point of view, a clear purpose, credible evidence, and technical word meanings. ● 29. Use academic vocabulary in writing to communicate effectively.
<p>CTE Lab Safety Guidelines</p>	<p>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).</p>
<p>Classroom Expectations</p>	<p>Classroom Expectations:</p> <ol style="list-style-type: none"> 1. Come prepared to learn everyday and follow all directions quickly. 2. Try to limit your time outside of the classroom as much as you can. 3. Try your very best every single day. 4. Be kind and respectful to everyone. 5. Keep your area clean 6. Keep all personal electronics out of sight during class
<p>Progressive Discipline (JMS Policy)</p>	<p>All progressive discipline will correspond with the Madison City Schools Code of Conduct regarding Class I and II offenses. Class III offenses are a direct office referral.</p> <ul style="list-style-type: none"> ● Warning ● Conference with student with parent notification ● Parent Contact ● Detention ● 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.
<p>Cell Phone Policy</p>	<p>Students are welcome to bring personal electronic devices to school. Students will not be allowed to use cell phones during class. Cell phones may used during class transitions and lunch. All cell phones must be placed in student’s backpacks or a cell phone holder sleeve that the teacher has placed in the designated area of the classroom during the entirety of the instructional block. Also, remember that the student is responsible for locking and securing personal devices. JMS is not responsible for lost, stolen, or damaged cell phones and other electronic devices. Students should ensure personal devices are always in a safe and secure location. Additionally, students may not use their devices to do anything inappropriate that would disrupt the learning environment at Journey Middle School.</p>
<p>Grading Policy (MCS Policy)</p>	<p>60% = Assessments (Tests, Essays, Projects) 40% = Daily Grades (Quizzes, Homework, Classwork, and Participation)</p>
<p>Late Work Policy</p>	<ul style="list-style-type: none"> ● 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. ● Students present in class on the day of instruction are expected to turn in all in-class and out-of-class assignments on time.

<p>Make-up Work/Test Policy</p>	<p>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.</p>
<p>Technology</p>	<p>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.</p>
<p>Accommodations</p>	<p>Requests for accommodations for this course or any school event are welcomed from students and parents.</p>
<p>Materials & Supplies</p>	<ul style="list-style-type: none"> ● Chromebook ● Pencils ● PLTW Notebook (provided by school) ● Wired headphones/earbuds <p>*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.</p>
<p>Homework</p>	<p>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.</p>
<p>Parent & Student Acknowledgment Form</p>	<p>Scan for acknowledgement form:</p>  <p>Link</p>