



Journey Middle School

217 Celtic Drive, Madison, Alabama 35758

Computer Science for Innovators and Makers

6th, 7th, & 8th Grade

Ms. Kelly Brunson

Teacher Contact Information

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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

Textbook Information

- Online PLTW curriculum (no textbook) www.pltw.org (login information provided in class)
- There is no required reading for this course

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

- 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:

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> <ul style="list-style-type: none"> • Come prepared to learn everyday and follow all directions quickly. • Try to limit your time outside of the classroom as much as you can. • Try your very best every single day. • Be kind and respectful to everyone. • Keep your area clean • Keep all personal electronics out of sight during class
<p>Progressive Discipline Procedures (JMS Policy)</p>	<p>All progressive discipline will correspond with the Madison City Schools Code of Conduct regarding Class I and II offenses. Some Class II and all 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>Electronic Communication Device Policy</p>	<p>Wireless Communication Devices</p> <p>A. Definitions</p> <p>1. Instructional Day –</p> <ul style="list-style-type: none"> • When school is open and in session; • During class time, lunch, transitions between classes, and any non-instructional periods; • Any time that students are required to store their Wireless Communication Devices under the Student Code of Conduct, or other school rules; or • Any other time, students are instructed to store their devices by school staff. <p>2. Wireless Communication Devices – Any portable electronic device that has the capability of exchanging voice, messaging, or other data communication with another electronic device, including, without limitation:</p> <ul style="list-style-type: none"> • cellular telephones • tablet computers • laptop computers • pagers • gaming devices • smart watches • earphones or headphones (Air Pods, ear buds, over the ear headphones, etc., whether wireless or not) <p>B. Possession of Wireless Communication Devices – Students are prohibited from bringing Wireless Communication Devices into school buildings and onto school grounds, except in compliance with this</p>

	<p>policy. The Board is not responsible for the theft, loss, or damage to any Wireless Communication Device brought onto campus by a student.</p> <p>C. Storage of Devices– At all times during the Instructional Day, students who possess a Wireless Communication Device on any campus or in any school must turn the device off and store the Wireless Communication Device off their person in a locker, car, backpack, purse, gym bag, or other storage location approved by school administrators. This storage requirement is subject to the exceptions set out in subsection D below.</p> <p>D. Prohibition on Use; Exceptions – Students are prohibited from using, operating, or possessing a Wireless Communication Device during the Instructional Day, except under the following limited circumstances:</p> <ul style="list-style-type: none"> • The use, operation, and/or possession of the device is specifically included in the student’s Individualized Education Plan (IEP), 504 Plan, or an Individualized Health Plan; • The use, operation, and/or possession of the device is for educational or learning purposes under the supervision of school personnel; and • The use, operation, and/or possession occur during an emergency threatening the life or safety of the student or another person. <p>The Superintendent or designee is authorized to develop additional guidelines for implementation of these exceptions.</p> <p>E. Searches – School officials may read, examine, or inspect the contents of any wireless communication device upon reasonable suspicion that the device contains evidence of a violation of Board policy, the Code of Conduct, or other school rules, provided that the nature and extent of such reading, examination, and inspection shall be reasonably related and limited to the suspected violation.</p> <p>F. Disciplinary Action – Any violations of this policy may result in disciplinary action under the Student Code of Conduct.</p> <p>G. Additional Procedures Authorized – The Superintendent or designee is authorized to develop any additional rules necessary to carry out this policy.</p>
Grading Policy <i>(MCS Policy)</i>	<p>60% = Assessments (Tests, Essays, Projects)</p> <p>40% = Daily Grades (Quizzes, Homework, Classwork, and Participation)</p>
Late Work Policy	<ul style="list-style-type: none"> • Students present in class on the day of instruction are expected to turn in all in-class and out-of-class assignments on time. • Late assignments will be reviewed and considered on an individual basis. As CTE/STEM courses simulate real-world work environments and emphasizes project-based learning, timely completion of tasks is essential. However, if circumstances arise, students are responsible for communicating with the teacher emulating positive employability traits; each situation will be assessed fairly and thoughtfully.
Make-up Work/Test Policy	<ul style="list-style-type: none"> • Students are permitted to make up work, tests, and other assignments, activities, etc., when absences are excused. 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 absence(s) must be made up within three school days after returning to school. However, for extended excused absences when homebound services are not necessary, the teacher may grant additional time, but not to extend beyond two weeks past the return to school. It is the joint responsibility of student and parent to ensure a student makes up work following excused absences. Teachers may alter assignments, tests, work, activities, etc., as necessary to ensure an accurate evaluation of the student’s performance after an excused absence. • 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	<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>
Cheating/Plagiarism	<p>A student who cheats will not receive credit for the work in question. If any other student has cooperated in cheating, that student is also considered to have cheated and will not receive credit. Cheating students will also be subject to disciplinary consequences in Section XXII of this CSC. Cheating is defined to include, but is not limited to:</p>

	<p>(a) copying someone else's work in or out of class and identifying and submitting it as your own</p> <p>(b) failing to quote and/or list appropriate citations for material derived from published sources (including the Internet) and identifying and submitting it as your own</p> <p>(c) the use of unauthorized notes, other materials, or assistance during the accomplishment of graded work in or out of class</p> <p>(d) any other situation in which the student attempts to or accepts credit for work not his or her own.</p>
Artificial Intelligence Acceptable Use Policy <i>(MCS Policy)</i>	<p>Madison City Schools acknowledges that technology is ever-changing and has a tremendous impact on our global society, local community, and classrooms. Artificial intelligence (AI), including generative forms of AI, is becoming more a part of our everyday lives. It is our responsibility to educate and train students to utilize AI in an ethical and educational way. Therefore, Madison City Schools is not banning the student or teacher use of AI, but each student will need to be aware of the limitations and guidelines of its usage:</p> <p>a. Madison City Schools student email accounts and Chromebook access to specific open AI software, such as ChatGPT, are blocked due to data and security concerns.</p> <p>b. Any misuse of AI tools and applications, such as hacking or altering data, is strictly prohibited.</p> <p>c. Teachers may allow the use of AI for curriculum purposes. Access to specific websites will be granted on an as-needed basis, adhering to specific data and privacy guidelines regarding age restrictions and usage.</p> <p>d. College Board and Dual Enrollment college and university classes may have additional restrictions and limitations regarding the use of Artificial Intelligence.</p> <p>e. Students who use AI software with a personal device and/or personal credentials should do so at their own risk, acknowledging that each platform is collecting various forms of data.</p> <p>f. Students must acknowledge the use of AI in any capacity related to their schoolwork, including text, images, multimedia, etc. The use of AI could be subject to the Academic Dishonesty Policy.</p> <p>h. Students should acknowledge that AI is not always factually accurate, nor seen as a credible source, and should be able to provide evidence to support its claims.</p>
Materials & Supplies	<ul style="list-style-type: none"> Students are expected to have a pencil, charged Chromebook, & paper/notebook Amazon Wishlist: https://www.amazon.com/hz/wishlist/ls/1MPFPVAY6KZGO?ref_=wl_share
Homework	<ul style="list-style-type: none"> 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/cUgGY2CGMG1FdkVVA