Liberty Middle School

281 Dock Murphy Drive, Madison, Alabama 35758

PLTW Computer Science for Innovators and Makers (CSIM)

Ms. Madison Peterson

Teacher Contact Information	**Email:** mkpeterson@madisoncity.k12.al.us **Classroom Phone:** 256-430-0001 ext. 83238 **Room:** Blue Pod 238
Classroom Digital Platforms and Instructional Materials	**Webpage Link:** https://www.madisoncity.k12.al.us/Domain/2920 **Schoology Link:** https://madisoncity.schoology.com/ **Coding Platform:** https://makecode.microbit.org/ **PLTW Curriculum:** www.pltw.org **(Student login through Clever)** *Parents and guardians can access other supplementary materials through Schoology.*
Textbook Information	There is no textbook for this course. The PLTW CSIM online curriculum will be used.
Materials & Supplies	All specialized materials will be provided. Students should be prepared for class with general school supplies and their Chromebooks and chargers.
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. The unit broadens students' understanding of computer science concepts through meaningful applications. Teams select and solve a personally relevant problem related to wearable technology, interactive art, or mechanical devices.
Course Prerequisites	None
Course Objectives	Students can apply computational thinking to solve problems. Students can recognize that computational thinking can be applied in multiple disciplines. Students can choose appropriate computational practices when solving a problem. Students can analyze and create algorithms. Students can analyze the structure and functionality of a program. Students can create programs by developing and testing code in a modular, incremental approach. Students can adapt or improve existing code. Students can describe the hardware components of an electronic device and how they interact with software and the environment. Students can analyze the implications of computing in society. Students can consider accessibility and equity when designing products, creating solutions and collaborating with others. Students can describe the role, connections between disciplines, and impact of engineering and computer science on society.
Instructional Delivery Plan, Course Outline, and Culminating Project	**Unit 1: BLINK (The Blink Unit Project)** *Students explore the capabilities of physical computing systems. They learn to use algorithmic thinking as they prepare to code. Students using block-based coding on the MadeCode micro:bit website to create and download programs to the micro:bit controller. 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.* **Unit 2: THE INS AND OUTS (Secrets and Safes Unit Project)** *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. **Unit 3: PROGRAMMING THE PHYSICAL WORLD (Interactions Unit Project)** *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.*
Credentialing	None
CTSO Integration ***(LMS 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 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. **TSA-based activities relevant to CSIM include but are not limited to the following: Lab Safety Posters, Coding Challenges, Career Prep, Cybersecurity, Essays on Technology, Challenging Tech Issues, and Digital Safety**.
Embedded Numeracy Anchor Assignment ***(Secrets & Safes Unit 2 Project: 10 points) includes conditional logic and inequalities with pressure, photocell and flex sensor coding for reading analog values)***	• 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.
Embedded Literacy Anchor Assignment ***(Secrets & Safes Unit 2 Project: 10 points) includes pair programming, writing algorithms, documentation of design process, verbal and written presentation of projects and relevant vocabulary)***	• 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.
Embedded Science Anchor Assignment ***(Secrets & Safes Unit 2 Project: 10 points) includes engineering design process, algorithms, scientific ideas and principles, testing and revising code and technical presentations)***	https://www.nextgenscience.org/ • NGSS.P1 Asking questions and defining problems in 6-8 builds on K-5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models. • NGSS.P5 Create algorithms (a series of ordered steps) to solve a problem. • NGSS.P6 Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. • NGSS.P6 Optimize performance of a design by prioritizing criteria, making tradeoffs, testing, revising, and retesting. • NGSS.P7 Evaluate competing design solutions based on jointly developed and agreed-upon design criteria • NGSS.P8 Communicate scientific and/or technical information (e.g. about a proposed object, tool, process, system) in writing and/or through oral presentations.
CTE Lab Safety Guidelines	Each student in a CTE/PLTW course will be required to complete a lab safety exam and score a 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). A copy of the lab safety rules is attached to this syllabus.

Classroom Expectations	1. **Be respectful towards others and the learning environment**: Respect others' talk time, opinions, identities, interests, and personal space, and help create a classroom where everyone can learn. 2. **Follow directions immediately**: Obey the teacher's instructions promptly without arguing or complaining. 3. **Use class time wisely**: Be prepared and on time for class, stay focused on completing work, and ask for help when needed. 4. **Be responsible with all personal and school property**: Use supplies safely and as intended, and help take care of the classroom and its items. 5. **Follow all school rules**: Continue to follow the MCS Code of Conduct on safety, dress, and behavior at all times while in the classroom. **Cell phones must be OFF and in a backpack from 8:15 am - 3:20 pm.**
Technology Procedures and Cellphone Policy ***(AL State/MCS Policy)***	Effective July 1, 2025, the use, operation, or possession of Wireless Communications Devices including but not limited to **cellular telephones, tablet computers, laptop computers, pagers, gaming devices, smart watches, earphones or headphones** in school buildings or on school grounds during the Instructional Day, is prohibited. Violation of Board policy with respect to such use, operation, or possession of Wireless Communication Devices will constitute a Class II violation. Madison City Schools has outlined an Electronic/Wireless Device Policy (Policy 6.20) on page 138 of the MCS Policy Manual. **Students should bring their MCS Chromebooks and chargers to class each day.** Teachers monitor student activity and participation; however, students are responsible for their activity on school-issued devices and using their MCS accounts.
Progressive Discipline ***(LMS Policy)***	**Step 1:** Verbal warning **Step 2:** Student/teacher conference with parent notification **Step 3:** Parent contact/conference **Step 4:** Detention **Step 5:** 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 *Note: All levels of classroom discipline will be documented in BLOOM. For infractions that start as a Class II or higher, as stated in the code of conduct, the student may be sent to the office with an office disciplinary referral and be excluded from the classroom; however, before referring a child with disabilities to the office for exclusionary discipline, the teacher will first ensure that they have complied with the student's Individualized Education Program (IEP), Section 504 Plan, or Behavior Intervention Plan (BIP).*
Grading Policy ***(MCS Policy)***	**60%** = Assessments (Projects, Unit Quizzes) **40%** = Daily Grades (Digital Notebook Submissions, Daily Classwork)
Late Work Policy	**Late work is accepted with no grade penalty until the end of the corresponding unit. Late work submitted after the end of the unit will be taken for 50% credit.** *Exceptions will be made on a case-by-case basis. Students can request a no-penalty assignment extension through communication with the teacher.*
Make-up Work/Test Policy	Students with excused absences will be allowed to make-up all work within three days of returning to school. It is the student's responsibility to ask for make-up work. Students can get with a classmate or ask the teacher for help. Work that is not made up will become a zero (including quizzes/tests).
Homework	No work will be assigned as homework, but assignments not completed during class time may need to be completed at home if the student is absent or does not manage their time in class properly.
Parent and Student Acknowledgment Form/Safety Contract	**Please complete the Syllabus Acknowledgment Form/Safety Contract and return it to the teacher. A signed safety contract is required to be on file for every student before they may use the equipment in this class.**

This syllabus is subject to change. If it changes, the teacher will contact parents and students.

Parent and Student Acknowledgment Form/Safety Contract

I acknowledge that I have read the syllabus for PLTW CSIM and agree to adhere to its policies and expectations for conduct and lab safety. I understand that if I do not meet the classroom expectations for behavior, I will be subject to consequences as described by the LMS Progressive Discipline Policy. I understand the policies for missing work, absences, grading, and technology use. I agree to follow the lab safety rules and understand that I may lose the right to use the equipment if I violate these rules. I understand that the syllabus is subject to change with notice from the teacher.

Teacher/Subject: Ms. Madison Peterson, PLTW Computer Science for Innovators and Makers

Student (Print Name) _____

Student Signature _____ Date _____

Parent/Guardian (Print Name) _____

Parent/Guardian Signature _____ Date_____