Journey Middle School
217 Celtic Drive, Madison, Alabama 35758
Design and Modeling - 6th, 7th, and 8th Grade
Thomas

Teacher Contact Information	**Email:** lethomas@madisoncity.k12.al.us **Classroom Phone:** Ext. 84303
Classroom Digital Platforms	**Webpage Link** **Schoology Link**
Textbook Information	● Curriculum is through myPLTW.org. ● There is no required textbook for this class ● There is no required reading for this class
Writing Projects	Any writing assignment will be created in the student's Madison City Schools Google Drive using the Google Platform, which includes Google Docs, Google Slides, and Google Sheets.
Course Description	9 Weeks Course Students discover the engineering design process and develop an understanding of the influence of creativity and innovation in their lives, while solving problems. They are then challenged to apply what is learned throughout the unit to design a therapeutic toy for a child who has Cerebral Palsy. Students will also learn the importance of effective communication of a design solution, the importance of team norms in a collaborative setting, and the critical role documentation plays in each step of the design process.
Course Prerequisites	None
Course Objectives	PLTW Design and Modeling (DM) is a nine-week, STEM unit of study. DM provides students opportunities to apply the design process to creatively solve problems. Students are introduced to the unit problem in the first activity and are asked to make connections to the problem throughout the lessons. Students learn to use methods for communicating design ideas through sketches, solid models, and mathematical models. Students will understand how models can be simulated to represent an authentic situation and generate data for further analysis and observations. Students work in teams to identify design requirements, research the topic, and engage stakeholders. Teams design a toy or game for a child with cerebral palsy, fabricate and test it, and make necessary modifications to optimize the design solution.
Course Goals	By the time the course is finished, students will be able to: - Persistently apply an iterative process to solve a problem or create an opportunity that can be justified. - Apply user-centered design principles when creating a solution. - Solve a problem using computational thinking, analytical, and critical thinking skills. - Analyze and describe design functionality by observation of an artifact.

	- Design and conduct an experiment that investigates a question. - Collaborate effectively on a diverse and multidisciplinary team. - Communicate effectively for specific purposes and settings. - Demonstrate the ability to manage multiple resources throughout a project. - Identify the variety of careers related to engineering, biomedical sciences, and computer science. - Demonstrate personal responsibility and initiative. - Apply a mathematical model to represent an authentic situation. - Construct a solid model.
Instructional Delivery Plan, Course Outline, and Culminating Project	Unit 1: Introduction to Design (Project 1.6 Investigate the Inside) Students discover the design process as they complete an instant design challenge to create an ankle foot orthosis. They learn thumbnail, orthographic, isometric, and perspective sketching as methods for communicating design ideas effectively without the use of technology. The use of a common measurement system is essential for communicating and fabricating designs. Students use both measurement systems and apply measurement skills while dimensioning sketches. They create and launch paper air skimmers and complete statistical analysis on their results. Students conduct a mechanical dissection in the lesson project to better understand how objects and parts interact while using sketches to communicate and document their findings. Unit 2: Solid Modeling (Project 2.4 Puzzle Cube Design Challenge) In this lesson, students transfer a two-dimensional representation to a three-dimensional solid model with technology. Students learn how to use a computer-aided design (CAD) application to create solid models of various objects and designs. During the design project, students work in teams and apply the design process to create a puzzle cube. Students create a solid model of their design using the CAD application and fabricate their design solution for testing. Students use a dynamic mathematics program to complete statistical analysis from their testing results to determine if their design met the criteria and constraints. Unit 3: Design Challenge (Problem 3.1 Therapeutic Toy Design) Within teams, students brainstorm and select a design solution to the Therapeutic Toy Design Challenge problem based on design requirements. They establish team norms, collaborate, and recognize that solving authentic problems involves interdisciplinary skills such as engineering and biomedical science. Using the design process, students create a solid model of their design, build a prototype for design testing, and make necessary design modifications based on testing results.
Course Outline	Week 1 - Lesson 1: Introduction to Design Week 2 - Lesson 1: Introduction to Design Week 3 - Lesson 1: Introduction to Design Week 4 - Lesson 2: Solid Modeling Week 5 - Lesson 2: Solid Modeling Week 6 - Lesson 2: Solid Modeling Week 7 - Lesson 3: Design Challenge Week 8 - Lesson 3: Design Challenge Week 9 - Lesson 3: Design Challenge *This is subject to change.*
Credentials	None

CTSO Integration *(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. *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*
Embedded Numeracy Anchor Assignment **(Unit 2 - Problem 2.4 - Puzzle Cube Design Challenge)** **100 Points**	MA19.6.25 - Graph polygons in the coordinate plane given coordinates of the vertices to solve real-world and mathematical problems. MA19.8.23 Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two- dimensional figures.
Embedded Literacy Anchor Assignment **(Unit 1 - Project 1.6 - Investigate the Inside)** **100 Points**	ELA21.6.7 - 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. 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 **(Unit 2 - Problem 2.4 - Puzzle Cube Design Challenge) 100 points**	SC15.8.8 - Use Newton's first law to demonstrate and explain that an object is either at rest or moves at a constant velocity unless acted upon by an external force (e.g., model car on a table remaining at rest until pushed).
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	1. Be prepared to learn each day. 2. Bring necessary materials to class each day. 3. Treat yourself and others with respect. 4. Respect the belongings and personal space of others. 5. Be responsible for all technology and supplies. 6. Set high expectations for yourself. 7. Follow all district-level, school-level, and classroom-level policies and procedures.
Progressive Discipline Procedures *(JMS Policy)*	**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.** ● 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.

Electronic Communication Device Policy	Wireless Communication Devices
	A. Definitions
	1. Instructional Day –
	    • 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.
	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:
	    • 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)
	
	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 policy. The Board is not responsible for the theft, loss, or damage to any Wireless Communication Device brought onto campus by a student.
	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.
	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:
	    • 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.
	The Superintendent or designee is authorized to develop additional guidelines for implementation of these exceptions.
	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.

	F. Disciplinary Action – Any violations of this policy may result in disciplinary action under the Student Code of Conduct. G. Additional Procedures Authorized – The Superintendent or designee is authorized to develop any additional rules necessary to carry out this policy.
Grading Policy *(MCS Policy)*	**60%** = Assessments (Tests, Essays, Projects) **40%** = Daily Grades (Quizzes, Homework, Classwork, and Participation) **Testing Days:** Mondays and Thursdays
Late Work Policy	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. 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	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	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.
Cheating/Plagiarism	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: (a) copying someone else's work in or out of class and identifying and submitting it as your own (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 (c) the use of unauthorized notes, other materials, or assistance during the accomplishment of graded work in or out of class (d) any other situation in which the student attempts to or accepts credit for work not his or her own.

Artificial Intelligence Acceptable Use Policy *(MCS Policy)*	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: 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. b. Any misuse of AI tools and applications, such as hacking or altering data, is strictly prohibited. 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. d. College Board and Dual Enrollment college and university classes may have additional restrictions and limitations regarding the use of Artificial Intelligence. 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. 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. 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.
Materials & Supplies	JMS Chromebook and Charger Colored Pencils/Markers Assorted Highlighters Pencils / Pens Glue Stick Individual Headphones / Earbuds with auxiliary jack cord (no wireless) Donations (Optional But Greatly Appreciated!): Index Cards Sticky Notes Loose-Leaf Paper Loose-Leaf Graph Paper
Homework	Students are allotted time in class to complete assignments. In the event that a student is absent or does not finish during class time, they will need to complete the assignment for homework.
Parent & Student Acknowledgment Form	Please click this link to find and complete the Parent / Guardian and Student Syllabus Acknowledgement Form for this class. This form acknowledges that you have read and understand the expectations and procedures of the class. Please contact me with any questions!