



Liberty Middle School

281 Dock Murphy Drive, Madison, Alabama 35758

Mr. Jacob Rogers

PLTW Design and Modeling

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Classroom Digital Platforms	Webpage Link: Mr. Rogers Webpage Schoology Link: https://madisoncity.schoology.com/home Distribution List Link: Power Schools will be used for parent contact info
Textbook Information	<i>Online PLTW curriculum (no textbook)</i> www.pltw.org (log in usernames provided in class)
Course Description	Design and Modeling (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 in the unit. Students learn and utilize 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 Objectives	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.
Course Outline	Lesson 1: Introduction to Design 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. Lesson 2: Solid Modeling 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. Lesson 3: Design Challenge 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. <i>Design and Modeling Portfolio Project Due at end of the 9 weeks (progressive project completed in class)</i>		
Classroom Expectations	1. Have a Vision 4. Feed Your Passion	2. Lean into Struggles. 5. Own Your Education.	3. Be a Learner, Not a Finisher 6. Be Respectful 7. Cheerful Collaboration
Progressive Discipline <i>(LMS Policy)</i>	Student behavior and discipline is an important component of any classroom. Misbehavior can be disruptive to the learning process for all children in the classroom. Therefore, each child will be held responsible for his or her own behavior. Please help us teach your child responsibility by also emphasizing the importance of the following rules:		
	Classroom Rules		Possible Consequences
	Enter class with a positive mindset for learning.		• Conference with the student • Parent contact – by phone or E-mail • Detention – break or lunch • Detention – A.M. or P.M. • Parent Conference • Administrative Referral • Fines Paid for Broken or Lost Technology • Student misuse of cell phones or tablets during class may result in a no cell phone in the classroom policy on an individual basis
	Be in your seat when the tardy bell rings.		
	Bring any and all assignments and materials to class.		
	Treat others as you want to be treated.		
	Food and drinks are not allowed in classrooms.		
	Be Responsible for ALL technology and cameras.		
	Behave in a manner conducive to learning for all.		
	Show respect for yourself and others at all times.		
	Cell Phones should be off and put away unless instructed by the teacher to be used as a device in class.		
	Follow all Lab Safety rules in class and all rules listed in your LMS Handbook, District Technology Policy & MCS Code of Conduct.		
Grading Policy <i>(MCS Policy)</i>	60% = Assessments (Tests, Projects, Mini-Assessments) 40% = Daily Grades (Quizzes, Exit Slips, Progress Checks, Classwork, Daily Activities, Participation)		
Late Work Policy	Late work will be accepted, however, it is the student’s responsibility to make arrangements with the teacher to submit the late work. It is also the student’s responsibility to notify the teacher when the work has been submitted so that it can be graded appropriately.		
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). Many times, missed quizzes and tests can be made up during school.		
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.		

Accomodations	Requests for accommodations for this course or any school event are welcomed from students and parents.
Materials & Supplies	Students should have all materials listed on the LMS School Supply List. A wired/wireless computer mouse is highly recommended for this course. It is not required, however, it will make using our design software much easier. All other materials for the class will be provided.
Homework	There will be no assigned homework, however, any classwork that is not completed during class, is expected to be completed in a timely manner.
Parent & Student Acknowledgment Form	Please use either the attached link or QR Code to sign and verify that you have read the course syllabus and agree to the classroom rules listed within. Parent and Student Acknowledgement Form 