



New Mexico Mathematics, Engineering, Science Achievement, Inc.

MESA USA Logistics Guide



Designing for Equity

Middle School: April 20, 2021

High School: April 22, 2021

Virtual Via Zoom

Official Logistics Guide



MESA USA GENERAL INFORMATION

For 2021, the MESA USA Event will be held as a separate event from the MESA Day Competition as part of New Mexico MESA's Competition Series. For full rules on either MESA Day or MESA USA please consult the required handbooks. This addendum serves as the official New Mexico Specific Logistics Guide that is to be used in tandem with the National MESA USA Handbook. All rules and guidelines detailed in the National Handbook are to be followed for the competition. This document will only contain information not included in the National Handbook.

COMPETITION OVERVIEW: The theme for the 2020-21 MESA USA National Engineering Design Competition is: *Designing for Equity*.

For this project, student teams will identify an individual or group who experiences some type of inequity (i.e., a user). Using a microprocessor as the key component of the design, teams will employ human-centered design practices to engineer a solution. Teams must use at least one of the following microprocessors as the main component of their design: *Arduino, Circuit Playground Express, and/or Micro:bit*.

Examples of *Designing for Equity* can be (but are not limited to) projects that address:

- A physical or learning disability;
- Food scarcity;
- Access to healthcare;
- Access to clean water or other resources;
- Access to employment or education; or
- A social inequity.

The components listed below will be used to assess the effective implementation of a human-centered design approach in the context of designing for equity, effective implementation of the engineering design process, and the functionality of the prototype.

1. **Design Brief** - The objective of the Design Brief is to provide a brief, non-technical overview of the entire project. Students must use the provided Design Brief Template. *This will be submitted at Registration and is REQUIRED to participate in MESA USA.*
2. **Technical Presentation and Interview** - The objective of the Technical Presentation and Interview is to provide an overview of the prototype functionality including a technical explanation of the mechanical operations, software operations, and integration of the two. Students will deliver a short presentation, which includes a demonstration of the functionality of the prototype, followed by a question and answer session with judges. *This will be conducted over Zoom the day of the event. Team times will be assigned.*
3. **Poster and Symposium** - The objective of the Poster is to provide an overview of the project, highlight key points of the design process, discuss relevant testing and data collection, present the

resulting prototype, and share recommendations for further development. Students will prepare an electronic academic poster. ***This will be submitted at Registration and is REQUIRED to participate in MESA USA.***

4. **Prototype Pitch** - The objective of the Prototype Pitch is to convince the audience that the design meets the user’s needs and has value as a product to address an issue of inequity. Students will prepare a creative, engaging presentation to pitch their prototype to an audience, including a group of judges. The presentation should define the problem; should show how they address the theme of *Designing for Equity*; provide a detailed description of the user and their needs; discuss current solutions to the problem and their weaknesses; and provide a demonstration of their prototype highlighting its advantages. ***This will be conducted over Zoom the day of the event. Team times will be assigned.***

ALL TEAMS: Each team will be composed of 2-4 students. *Because some items are due prior to competition, teams must be determined by the initial registration deadline.*

- Final team members must be declared when submitting the final registration materials and required items. No changes, alternates, or additions are allowed after this point.
- Any team that requires any particular accommodations must make a request to NM MESA when submitting the final registration materials.
- The 1st Place overall winning teams in both the middle school and high school level will be chosen to represent New Mexico in the 2021 MESA USA National Engineering Design Competition in June, 2021 hosted by MESA Arizona. Only members that attend and participate in the State Competition will be allowed to participate in the National Competition. No changes or additions are allowed.
- The 2021 National Competition will be virtual this year.

It is suggested to start with a team of 4 in the event a member cannot participate in the State and/or National Competition. Team names MUST be declared as follows: (School) (Level) – (Team Unique Name). *Example: Mesaville High School – Team Potter or Mesaville High School Team Potter*

ELIGIBILITY: All participating teams must come from official New Mexico MESA School Programs. Schools must be considered official, and advisors must enter all profiles (A-2’s) and submit all A-1’s to their Regional Coordinator’s Office by **10 AM MST, Monday, March 22, 2021**. Only the students listed on the roster (have their A-2 submitted and have their A-1’s submitted) will be eligible to participate. **NO EXCEPTIONS!**

Of Special Note to Middle/Junior High Schools serving 9th grade students – Each middle/junior high school that includes a 9th grade class is allowed to have an event team with a maximum of 50% 9th grade students. These teams will compete in the Middle School division **only**. **No** 100% 9th grade teams will be allowed in middle school competition.

ATTENDANCE AND QUALIFICATION: All schools will be allowed to participate in MESA USA as follows. Please use the table to determine the number of teams your school can bring. This is different from previous years’ allotment.

MESA USA Track	
Small School: <= 30 profiles	Max number of teams=2
Large School: >=31 profiles	Max number of teams=4

PLAGIARISM AND ADVISOR POLICY:

Academic honesty and personal integrity are essential to ensure future success as college students and STEM Professionals. As such, NM MESA expects that the work will be solely the work of the students. If the work or ideas of another are used to further students' work, then proper credit must be given to the owner. Failure to do so will result in an act of Plagiarism. If it is determined that a student committed plagiarism, they will be disqualified from the competition and will be ineligible to receive any awards. They may also risk further sanctions from MESA USA and/or their MESA State.

All questions/concerns must be addressed by the student team (not the advisor) to the Event Coordinator at the time of the Event.

TECHNOLOGY: Teams arriving late to their assigned competition times will participate at the discretion of the lead judge. Because this will be a virtual event, please ensure students are at a location with reliable internet and are using technology that is compatible with the applications described. Prior to the event, full information will be provided to all registrants that will include contact information for event coordinator, final event schedule, log in information, test sites, etc. All events will have an allotted time to allow for all students to log in as needed.

All students are required to be on camera for this event. If there are any issues with this policy, additional information must be provided during registration and approval must be granted in advance. The Prototype Pitch event(s) will be streamed live.

STATEWIDE OFFICE MIMS CREDIT:

Students that submit items at the initial registration deadline will receive an "Other Competition" Participation Credit in MIMS. Students that actually compete in the MESA USA Event will receive a MESA USA Participation Credit in MIMS as it is the qualifying event for our National MESA USA Competition.

- Additionally, students that complete and submit interest form and early phase project form as directed will receive a workshop credit for each submittal. Forms will be available on the MESA USA Website

AWARDS: (Middle and High School)

Overall Teams: Placing 1st-3rd Overall

- Trophies will be awarded to the top 3 overall teams (1st-3rd Place).
- Awards will be presented to individual team members placing 1st – 3rd Place.
 - 1st Place-Will represent Team New Mexico at the Nationals Competition. Also will receive a Windows Based Laptop Computer and Microsoft Office Software (Approximately \$500-600 Value).
 - 2nd Place-\$100 Gift Card
 - 3rd Place-\$75 Gift Card
 - NOTE: A team must accept representing New Mexico at our National Competition to receive computer package. Otherwise, they will forfeit computer prize package to next level winner and will receive a different prize package.

Individual Event Awards:

- Plaque Awards will be presented to the top team in each individual event (1st Place).
- Additional awards may be provided.

IMPORTANT: Awards will not be presented at the MESA USA Competition. To ensure accuracy and to accommodate all virtual schedules, final scoring will occur upon the conclusion of the event and a live virtual

announcement will be done at 3:00 PM on April 23, 2021.

DISQUALIFICATION: Individual event teams can be disqualified for the following:

- Any team member not having a Student Profile (A2) in database or A1 on record
- Anyone else completing or helping with task that is not the registered team
- Prohibited advisor, parent, or other “outside” assistance in events
- Lead judge disqualifies an event team for not following event guidelines
- Unauthorized use of cell phones during event(s) to include phone calls, internet, and/or texts
- An event team is found to have violated event guidelines after competition has concluded
- General inappropriate behavior at any time during the competition
- If after competition is concluded, it is found that any team violated rules or requirements for any event, they may be disqualified from competition and will forfeit any qualification or placement spots they may have earned.

ADDENDUMS AND EVENT RESOURCES: There are several addendums and resources which will be useful in preparing for MESA USA. All addendums will be available on the NM MESA-MESA USA Event Website. These include:

- Any Final Logistical Information
- Link to National MESA USA Page
- Event Resources and Helpful Preparation Information
- MESA USA Frequently Asked Questions (FAQ)
 - Will be changed throughout year as questions arise

It is the responsibility of the school program to periodically check for resources and updates. Before competition date, it is STRONGLY encouraged as the FAQ section will contain any clarifications and/or addendums to the event handbook and these will be followed at competition. The FAQ document is an official MESA USA Document and is the official addendum to this handbook.

MESA USA REGISTRATION: This is required for any team wanting to attend MESA USA. All qualification registration and submittal of materials will be done via the Cvent System with a direct link on the MESA USA Event Page on the NM MESA Website. **ALL REGISTRATION WILL NEED TO BE SUBMITTED ELECTRONICALLY BY MONDAY, MARCH 22, 2020 AT 10 AM MST.**

It is the same deadline, but it is a separate registration from MESA Day.

There is not a registration form collected in hard copy, but the following information will be needed to complete on-line registration. (1) Registration will be done per school and will collect all needed information for MESA USA participation.

Information You Will Need Per School Registration:

- How many teams you are bringing (and eligible for)
- Unique Email Address
- School Name, Level (HS or MS), Region
- Advisor Information and Contact information (phone, email, mailing address)
- Student Names and Contact Information (phone, email, mailing address)
 - NOTE: There have been problems with student school emails accepting emails from the nmmesa.org domain. ENSURE that there is a good email as direct contact will be made to the competing student(s) by the Event Coordinators as needed.
- Any specific team requests and/or information

Team Submittals You Will Need to Upload Per Team in School Registration:

- Design Brief Completed Template:
 - MUST be submitted in Portable Document Format (.PDF) as (1) Document.
- Academic Poster
 - MUST be submitted in Portable Document Format (.PDF) as (1) Document.

CONTINUING PROJECTS: MESA USA recognizes that there is both an interest in and benefit for student teams to continue work on a project started in previous years. However, as this is the start of a new National Engineering Design Competition cycle, all projects must be new and original. Teams cannot continue working on a project started in previous years.

Because we did not have a MESA USA State Competition in 2020, but partial requirements were submitted, the following will be allowed:

- If a team is FULLY intact (all team members returning): Teams will be required to submit a continuing project form and must declare all work completed through the 2019-2020 school year. Project will ONLY be graded on new and current work and user must be revisited. This project may not be used for MESA Day competition in any variance.
- If a team is NOT FULLY intact (not all team members returning): Project must be new and original as current project must be the work of the entire current team. It may be adapted from previous research, but credit must be cited to previous team. All adaptations must be significant to be considered a new prototype. This project may be used for MESA Day competition if “New and Original”.

GENERAL EVENT AGENDA:

MESA USA COMPETITION GENERAL AGENDA

Tuesday, April 20, 2021: Middle School - Thursday, April 22, 2021: High School

TIME	Description	Zoom Code
8:00 AM	Judges Report for Event Orientation	TBD
	Advisors Meet with Teams Individually as Needed	
9:00-9:45 AM	Event Kickoff and Welcome: All Participants Log In	TBD
10:00-4:00 PM	Event Competition	
	Zoom Webinar Room 1: Middle School Pitch	TBD
	Zoom Webinar Room 2: High School Pitch	TBD
	Zoom Room 3: Middle School Technical Presentation and Interview	TBD
	Zoom Room 4: High School Technical Presentation and Interview	TBD
	Zoom Room 5: Help Desk and Information	TBD
4:00 PM	Closing Remarks: All Participants Log In	TBD
	Student Teams Will Only Need to Login at Their Assigned Times Times may be Adjusted to Accommodate all Submitting Teams	
	Awards Ceremony – Friday, April 23, 2021	
3:00 PM	Awards Ceremony: All Participants Log In as Desired	TBD

TIMELINE: Below is a suggested modified timeline to prepare for the MESA USA Competition.

Month	To Do
August	Regional Coordinator Contact and Training as Needed. Regional RAMS-Advisor will give a review for the year. Release of the MESA USA Handbook.
September-October	Recruit for NM MESA Program in Virtual Year Microprocessor Trainings #1
November	Install any needed software and make arrangements for computer usage. Verify school procedure for buying and ordering materials. Start creation of teams and groups for projects. Start brainstorming client needs and client identification. Start Engineering Design Notebooks. Start any introductory Microprocessor lessons to familiarize software and hardware. Start sensor research. Receive Microprocessor Materials. MESA USA Benchmark #1 Due (Optional)
December	Microprocessor Trainings #2 Receive Gift Cards for Additional Materials. Create Project Plan and solidify team. Compile team research and identify chosen client and community need. Conduct market and competitor research.
January	Determine what to Prototype and create materials list. Order any preliminary materials and sensors. Microprocessor Office Hours Begin. Start building prototypes and testing Start programming. Continue to document all work in Engineering Notebook. Refine Project Plan to meet current progress and school plan. Ensure computer availability and access for upcoming dates and requirements.
February	Build prototypes and conduct testing Continue to document all work in Engineering Notebook. MESA USA Benchmark #2 Due (Optional)
March	Iterate, monitor, and evaluate prototypes. Using Engineering Notebook: Complete Design Brief and the Academic Poster. Continue to check the NM MESA USA Page for needed information located on the NM MESA website. SUBMIT MESA USA Registration-March 22, 2021 @ 10 AM
April	Continue to Finalize Projects Practice Interview Skills, Pitch, and Prototype Demonstration MS MESA USA Competition: April 20, 2021 HS MESA USA Competition: April 22, 2021 Competition Final Scoring and Awards LIVE Announcement: April 23, 2021 @ 3:00 PM
May-USA	Winning Teams to convene for Initial Nationals Retreat Start review and refinement of project for National Guidelines and Competition
June-USA	Winning Teams to convene for 2 nd Nationals Retreat and Draft Presentation Finalize National Competition Materials-Submit Final Project Report and Submit and needed Printed Materials. 2021 MESA USA National Engineering Design Virtual Competition Hosted by Arizona