



The 2019 M.A.D.E. (Morganton Arts Design and Engineering) Competition brought together ten Burke County Middle and High School teams to compete in the live build Wind Turbine Challenge. The Historic Morganton Festival, Inc. along with Burke County Public Schools is proud to announce the 2020 M.A.D.E. Challenge and invite you to join. During Friday, September 11th and Saturday, September 12th; area Middle and High School students will compete in the “Rescue Robot Challenge”, an on site engineering and design challenge during the Morganton Festival in downtown Morganton, NC.

The competition highlights the region’s brilliant minds with a competition series that features the abilities of young students. MADE engages students in critical thinking, design, engineering and innovation in a way that works toward meeting the needs of area industry.

The 2020 M.A.D.E. Competition invites Middle and High Schools from across the Unifour to compete in the M.A.D.E. “Rescue Robot” challenge. You must reserve your spot by March 1, 2019. The competition is first come, first serve until all spots are filled. There are a total of 15 school team spots available with 4 students allowed per school team.

Contestant Prizes for Supporting School Program (checks made to school)

**High School**

1st Place - \$1000

2nd Place - \$500

3rd Place - \$250

**Middle School**

1st Place - \$1000

2nd Place - \$500

3rd Place - \$250

In addition to 1st, 2nd, and 3rd place prizes, each school that signs up will receive a \$250 stipend to go toward their competition entries.

## M.A.D.E. Challenge

This year's MADE competition will be an on site challenge where competing teams will bring a machine that they feel will put their team in a position to compete. This bot will be each team's prebuilt answer to the criteria of the engineering challenge presented below.

This year's competitors must build a remotely controlled machine that will retrieve items that need to be "rescued" and returned to a safety area within the timeframe allocated. The test rig will be a series of connected platforms with different "terrain" and obstacles that must be overcome to get to the items of interest.

### General Information and Expectations

- Teams will build and bring a machine that they feel will satisfy the constraints and will complete the challenge in a timely manner.
- Teams will be allowed to practice, adjust and tweak their machine to better match the physical on site testing rig.
- Teams will be allowed to bring any style of machine/ robot as long as it is of their own construction. It is generally expected that most teams will use a VEX style platform. Similar arduino builds are also acceptable. A manufacturer built machine/bot will not be allowed. These solutions should be student generated builds.
- Machines will have general size criteria given closer to the challenge reveal
- The testing rig dimensions and plans will be distributed to all teams by the end of March. This will include a detailed video as well as the opportunity for team sponsor/ team members to come see the physical rig itself. NO PRETESTING before the competition will be allowed on the "official" MADE rig.
- Each team will be given an "action camera" that they can choose to attach to their build in order to remotely drive their vehicle with the help of a spotter for a bonus point multiplier.
- Generally speaking, a claw bot that is modified to work around the terrain would be a good starting spot for your planning.
- Teams will earn points for the rescued items. The items will have different point values depending on size, shape and difficulty of access.
- Teams that return the most points to the safe zone within the allotted time will win. In the case of a point tie, the faster team will win.

### General Test Rig Constraints/Descriptions

- The testing rig will consist of 3 platforms connected by ramps of varying angles. Each platform will loosely be based on 4 x 8 sheets of plywood.
- There will be static and movable obstacles on each platform.
- Ground clearance will be an issue in certain areas.
- The rescue items will be of different shape and size.

- The rescue items will be located at different heights from the platform surfaces.
- Certain parts of the rig will be obscured from view from the driving area.

### **Loose Machine/Bot Constraints**

- There will be a size constraint of the machine when it begins. It will have to fit in a box of a certain size. The idea being this is a product that can be shipped to a rescue site quickly.
- Bots can expand (by themselves) from that initial size in order to complete the challenge.
- There is not a limit on the number of machines a team can utilize (as long as together they follow the box constraint above) but there can only be a single driver and a spotter active during the rescue.
- Bots can be designed to carry several rescued items or just one and travel back and forth.
- Bots that expand after starting DO NOT have to contract back to the original form at the end of the timed event.
- Bots using the camera must have the camera installed when it is packed in the box.
- One camera is given but teams may add a second one (purchased by the team) of their choosing if they desire to have a two camera bot. The viewing software and devices to view cameras on must be supplied by the team.

### **On Site Supplies**

- It is expected that all groups show up with a working bot. As always, things will need adjustment and the on site supplies are designed for that. There will not be enough materials for full rebuilds
- Basic Vex materials will be on site. This includes basic metal pieces as well as nuts and bolts.
- Electrical outlets will be there for battery charging and computer use.
- 3 Lulzbot 3-D printers that will be used on a first come first serve basis.
- Basic tools- pliers, screwdrivers, hex tools, hacksaws, bandsaw
- Random wood and metal pieces.

### **What You Bring**

- Your machine, tools, parts, computers and software.
- The action camera/cameras and associated viewing devices and software
- A good attitude.

### **Team members**

- Each team will consist of a maximum of 4 members and a teacher/supervisor who will help facilitate safety and time schedules.
- Each team member must be present for safety instruction at the beginning of the competition.

## Interested? Next Steps

- Sign up with the forms below to reserve your place.
- The spots will be first come first served
- You can reserve your team spot even if you do not have all team members lined up yet. There will be a deadline on team member names and if there is not a submission your spot will be given to the next team in line.
- Start brainstorming and building with your team!

The Official 2020 M.A.D.E. Design Brief will be delivered by March the 15th. This will include the final rules for the bot build as well as specific measurements of the platform and associated materials. This will include a detailed video of the final test bed.

## Competition Days Tentative Timeline

- 11:30AM Friday-Teams can arrive on site to set up.
  - Each team will receive a confirmation map including parking & load-in/load-out information prior to the event. Each team will be allowed a determined booth space along with two tables and two chairs. You are responsible for drop cords, signage and/or any other equipment.
- 12:30PM - Official intro, team meeting and rules recap
- 1:00- 7:30PM - Practice, trials and adjustments on the testing rig
- 9:30AM Saturday- Site opens for practice
- 9:30AM- 2:00PM - Final practice
- 12:00PM- Lunch provided by Historic Morganton Festival
- 2:00- 4:00- Official testing
- 4:30- Announcement of winners
- 8:00 PM- Winners announced on the Main Stage of the Historic Morganton Festival before the headliner. First Place teams in the Middle and High School Division are invited onto City Stage. Teams should meet at the Burke Chamber of Commerce/Festival Headquarters (110 East Meeting Street) to be escorted backstage.
- Rain Date Policy: Event takes place Rain or Shine!

**2021 MADE Competition will be September 10-11, 2021**

**\*Please note that details may change as the testing site is built. All teams will be notified in advance of changes to the challenge.**



## Participant Entry Form

M.A.D.E. Team Name: \_\_\_\_\_

School Name: \_\_\_\_\_

Contact Name (lead teacher + t-shirt size): \_\_\_\_\_

Email: \_\_\_\_\_

Phone: (Office) \_\_\_\_\_ (Cell) \_\_\_\_\_

Mailing Address: \_\_\_\_\_  
Street or Box # City State Zip

Team Members + t-shirt sizes (limited to 4 per school): \_\_\_\_\_

For general competition questions (competition location, logistics, entry edits, etc.), please contact Abby Nelson at [anelson@ci.morganton.nc.us](mailto:anelson@ci.morganton.nc.us) or call 828-438-5280. For technical questions (rules & regulations, standards, etc.), please contact Paul Gantt at [pgantt@burke.k12.nc.us](mailto:pgantt@burke.k12.nc.us)

Please read all of the guidelines and sign below: I acknowledge that I have read and will abide by the 2020 M.A.D.E. Competition guidelines. I understand that if I violate any rule, the competition officials may terminate my participation. I release the Historic Morganton Festival from any responsibility for theft, damage or loss.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

WAIVER AND RELEASE FOR M.A.D.E. COMPETITION

As the parent or guardian of \_\_\_\_\_, who is under the age of 18 years, I sign this Waiver and Release for the City of Morganton on his or her behalf, and agree and acknowledge as follows:

1. \_\_\_\_\_ is a student at \_\_\_\_\_ [Middle][High] School, and wishes to participate in the 2020 Burke County schools M.A.D.E. competition on September 11-12, 2020, which will involve teams of students designing, creating, constructing and displaying an object or objects in a judged competition.
2. I understand that the M.A.D.E. event is to be held in downtown Morganton during and as a part of the Historic Morganton Festival (which is an event of Historic Morganton Festival, Inc.), and will be at least partially conducted on City property or on public streets and sidewalks
3. Both my child and I understand and agree that participants in the competition may, and will be expected to, use various hand tools and power tools as part of the creation and construction process, under supervision of teachers, staff or other adults.
4. Both my child and I understand and accept that use of the various tools which may be needed or required in the competition involves some risk of bodily injury.
5. In order to participate in the M.A.D.E. competition, my child and I have both been required to read, accept and sign the appropriate rules and regulations of the Burke County Public Schools for such activity, including a Student Safety Contract governing my child's conduct.
6. I understand that the City of Morganton and Historic Morganton Festival, Inc. require all participants in the M.A.D.E. competition, or if minors then their responsible adults, to sign a Waiver of liability and Release of claims in the form of this document.
7. As responsible parent of \_\_\_\_\_, by signing this document I agree that neither the City of Morganton nor Historic Morganton Festival, Inc. shall be liable or responsible for any injury or damage to my child resulting from or caused by the use of any tools or equipment, or any other aspect of his or her participation in, the M.A.D.E. competition, unless such injury or damage is caused by clear negligence on the part of the City or the Festival.
8. To the full extent allowed by North Carolina law, I further agree to waive, and do hereby waive, any claim against the City of Morganton or Historic Morganton Festival, Inc., for damages for bodily injury to my child which may arise or result from the participation of my child in the M.A.D.E. competition, including any claims for medical expenses.
9. To the full extent allowed by North Carolina law, I further hereby release the City of Morganton and Historic Morganton Festival, Inc., and their respective officers, employees, agents and departments, from any and all liability for personal injury to my child arising out of or resulting from his or her participation in the M.A.D.E. competition on September 11-12, 2020 in downtown Morganton.

This the \_\_\_ day of \_\_\_\_\_, 2020.

\_\_\_\_\_

Signature