Event Specifications
Mobile App Creation
MESA Day 2022

LEVEL:	Middle School and High School
NUMBER OF TEAMS:	One (1) team per school can participate at the MESA Day state competition. Up to three (3) teams can participate at MESA regional events. Subject to change.
TEAM MEMBERS:	Two (2) to Five (5) Students per team
OBJECTIVE:	Students will use the Human Centered Design model to design a mobile phone app (Android or iOS) to solve a problem in their community.
MATERIALS:	MIT App Inventor (https://appinventor.mit.edu) or other app creation software

BACKSTORY:

Apps are the way computers and phones run their programs. There are apps to order food, apps to play games, apps to read the news, apps for anything. The ability to develop an app (computational thinking) is an essential skill for the 21st century world.

This design challenge is based on the **Technovation Girls Challenge**. MESA teams whose members are all female or female identified may be eligible to enter this challenge with the same app developed for MESA. For more information visit https://technovationchallenge.org/.

DESIGN PARAMETERS

1. Designs must be:
   a. Developed using MIT App Inventor or similar program (see resources for links)
   b. Research, Developed and Designed by students
   c. Designed to solve a problem in their community
2. Code: Teams may use publicly released libraries, example code, and tools, but your team must also develop original code.
3. Deliverables:
   a. Design Brief which will include:
      i. School Name
      ii. Team Members Names
      iii. App Name
      iv. Problem Statement - 100 words describing the problem and how the app intends to address this problem.
      v. Screenshots of the App that show how users will interface and content of the screens
   b. Pitch Video
      i. Must be 3-5 minutes long
      ii. Teams must share via Youtube link or Cloud Storage Link (like Google Drive, OneDrive, Dropbox).
   c. Technical Presentation & Interview
      i. "Live" via on-line or in-person (depending on school district guidelines) presentation focusing on the human-centered engineering design, brainstorming, inspiration, challenges, teamwork dynamics,
      ii. Code: Students should explain their usage and details of their code
      iii. 5 minutes presentation plus 5 minutes Q&A from judges

iii. Code must include at least one of these:
1. API Keys - Application Programming Interface Keys are used to get information from another website or database. Often used to assist in tracking and controlling how the interface is being utilized.
2. Database Usage - Information stored on or accessed by a phone are often stored in databases. Your app must incorporate use of a database. Examples of databases used in phone include contacts, stored messages, and bookmarks in a web browser.
3. Phone Function or Sensor Incorporation
   a. Phone Functions include Camera, Speaker, Microphone, GPS, Storage, and more.
   b. Phones Sensors include: Accelerometer, Pedometer, Gyroscope, Magnetometer, Clock, Location Sensors, Proximity Sensor, etc.

d. Engineering Design Notebook - must either be a virtual notebook or submitted as a PDF Document.
e. Business Plan (High School only)
   i. 5 page maximum submitted as a PDF document.
   ii. Details Problem being addressed
   iii. App's Mission and Vision
   iv. Market Research
   v. Financial Projections
   vi. Future Plans

SUBMISSION GUIDELINES:

1. Deadline:TBD, teachers along with staff will come up with calendar on Winter 2022 TPD.
2. Materials unable to be accessed by MESA staff will not be considered for scoring. It is the team's responsibility to ensure materials are accessible.
3. Late materials will not be accepted. It is the team's responsibility to ensure materials are submitted prior to the deadline.

SCORING CRITERIA:

1. Teams will be judged on the following categories (see Rubric for more details):
   a. Ideation (up to 20 Points)
   b. Pitch (up to 10 points)
   c. Technical (up to 20 points)
   d. Entrepreneurship (up to 20 points) - High School Only
   e. Overall Impression (up to 10 points)
   f. Engineering Notebook (Multiplier)
2. The Final Score will be determined by multiplying the Performance Score by the Notebook Multiplier (N).
3. The Performance Score will be determined by adding together the points received for Ideation, Pitch, Technical and Entrepreneurship.
4. The Notebook Multiplier will be determined by dividing the notebook score by the maximum points. (50 or 70 point maximum) If team does not submit a notebook their notebook multiplier will be .10. For example, if a notebook receives 20 points. The notebook multiplier will be .80 (20/25).

RESOURCES:

MIT App Inventor - https://appinventor.mit.edu/

Techovation:

- Challenge Information - https://technovationchallenge.org/
- Curriculum for App, Pitch, and Business Plan development - https://technovationchallenge.org/curriculum-intro/registered/

This rubric is adapted from the rubric used in the 2020 Technovation Girls Challenge.

Ideation (20 total Points)	**1 Point**	**3 Point**	**5 Point**
Evidence of Important and Meaningful Problem	● No description of problem or research ● No evidence of personal or community connection to problem	● Team demonstrates how problem impacts people ● Some personal or community connection to problem present ● Statistics related to problem	● Team demonstrates that problem is very important in scale and impact on world ● Strong personal or community connection to problem ● Community surveys, expert interviews, or statistics build understanding of problem
Potential Impact on Users	● Team has not considered impact on users or community/world ● No user research	● App could contribute to solution that will impact at least one group positively ● User research conducted in community	● Evidence of app's potential positive impact ● Team adapted app or idea in response to substantial user research and/or testing in the community
Innovation	● App is not innovative ● Mobile app is not the right tool to address the problem	● Improves or reduces cost of something that already exists, OR ● Raises awareness and drives behavior changes, OR ● Applies an existing approach to a new situation	● Fundamentally new solution, use of technology, or idea of how to do things
Competitor Analysis	● No evidence of competitor research	● Evidence of competitor research	● Description of how app or idea changed in response to competitor research

Technical (20 total points)	**1 Point**	**3 Point**	**5 Point**
App Function	● It's unclear if app can work ● Only first screen developed	● App is developed beyond login screen ● Bugs can be present	● Full functionality of app shown in pitch video or app launched in the app store
User Experience and Design	● App is missing obvious features ● Target audience not considered in design	● App appears easy to navigate and use ● Team incorporated user feedback	● App well-developed for target audience ● Team went through 3 or more cycles of testing and refining the app
Technical Learning	● No explanation of technical learning	● Some team members share what they contributed to the code or what they learned	● All team members share what they contributed to the code and what they learned
Code Complexity	● Code only has simple commands ("when," opening other screens) ● Does not use any sensors, phone functions, or databases	● Code includes advanced commands (e.g. loops, conditionals) ● App uses a sensor or phone function (e.g. camera, GPS, text message)	● Code includes advanced functions such as using a local or external database with APIs ● App uses more than 1 sensor, phone function, or different technology (e.g. AI, hardware)
Pitch (10 total points)	1 Point	3 Point	5 Point
Convincing Pitch	● Video is shorter than 3 minutes or longer than 5 minutes ● Difficult to understand the problem, community, and team's ideas ● Cannot hear video or understand language (e.g. no subtitles)	● Viewer feels positive about the app at the end of the pitch ● Pitch would benefit from more techniques to engage the viewer	● Pitch conveys urgency of problem and effectiveness of solution ● Creative video ● Viewer engaged throughout the pitch
Growth and Perseverance	● Team does not share challenges or how their ideas changed ● No evidence of growth (ex learning technical skills, collaboration, other)	● Team shares how they have faced challenges or dealt with ambiguity ● Team shows how they grew (ex learning technical skills, collaboration, other)	● Team shares journey, how they responded to challenges or ambiguity, and how they have grown along the way

Entrepreneurship (20 total points) - *High School Only*	1 Point	3 Point	5 Point
Feasible Marketing Plan	● No strategy to bring the app to market	● Clear goals about how to reach target users and details about pricing, promotions, and distribution	● Clear goals and concrete plan to reach target users and has integrated feedback from initial marketing attempts into plan
Financial Sustainability	● No budget or plan for starting or sustaining the business	● Confusing or unrealistic financial plans to start and sustain business ● Budgets or research contains flaws	● Clear and realistic financial plans for starting and sustaining the business into the future ● Supported by budgets and research
Overall Strong Business Plan	● Business plan is missing multiple parts ● Identity of the business is incohesive and lacks branding	● Team has made an effort to create a logical business plan ● Aspects of company, product/service descriptions or market analysis may need more work ● Business has a clear identity with name, logo, branding, visuals	● Business plan is cohesive and realistic ● Includes logical company and product or service descriptions, market analysis, and graphics to help viewer understand content ● Branding is clear and amplifies team's purpose
Overall Impression (10 total points)	1 Point	3 Point	5 Point
Future Goals	● Team does not share any future plans for their idea or business	● Team provides plans for future learning or how to develop their idea or business	● Team clearly outlines how they will continue to work to make their ideas a reality ● Team shares goals that have been impacted by work on their idea
Do you think this invention can succeed?	● Keep thinking it through! It's not yet clear how the idea and technology will work ● It's unclear how people would use it	● It's on its way! The idea and technology need a little more development but it can get there ● The community would benefit from this app	● Absolutely! This idea makes sense and the app is well thought out ● The world would benefit from this app

Rubric for Engineering Design Notebooks (EDN).

EDN Goals	3	2	1	0
1. Explore				
☐ Described Design Objective ☐ Described Success Criteria ☐ Described Constraints ☐ Described Variables and Constants	All	Most	Some	None
☐ Described Prior Knowledge ☐ Described Brainstorming ☐ Described Exploration (testing materials, modelling, etc.)	All	Most	Some	None
☐ Has Research documented with at least 5 sources (website, book, video, article, interviews, etc.) ☐ Research is reliable (i.e. experts, researched websites, etc.)	All	Most	Some	None
2. Design				
☐ Describes materials used ☐ Documents data from previous trials ☐ Documents modifications	All	Most	Some	None
☐ Includes sketch/photo of initial prototype ☐ Includes sketch/photo of final prototype	All	Most	Some	None
3. Test				
☐ Has data in graphical form ☐ Has written description of data ☐ Multiple iterations	All	Most	Some	None
☐ Describes pros and cons of data results ☐ Discusses next steps ☐ Tests are well designed	All	Most	Some	None
4. EDN Organization				
☐ Has Table of Contents or clearly labelled sections ☐ Notebook is organized	All	Most	Some	None
4.2 Labeled. Clearly labeled with School and Team Members names.			Yes	No
Column Totals (for selected categories)				
			Total (out of 25)	

Comments/Suggestions: