

Name _____

Environmental/Agricultural Innovation

STEM Expo

Judging Evaluation Form



Grade _____ Location _____

General Requirements Evaluation*

Presentation Display		Descriptive Document (if present)	
Attractive, easy to read, and layout is in appropriate logical order	ND 1 – 2 – 3 – 4 – 5 NA	Organization is clear and complete without extraneous information.	ND 1 – 2 – 3 – 4 – 5 NA
Visual aids promote understanding	ND 1 – 2 – 3 – 4 – 5 NA	Spelling and grammar correct	ND 1 – 2 – 3 – 4 – 5 NA
Shows project in appropriate detail for understanding by audience	ND 1 – 2 – 3 – 4 – 5 NA	Visual aids promote understanding	ND 1 – 2 – 3 – 4 – 5 NA

Environmental/Agricultural Innovation Category Evaluation**

Innovation and Implementation Plan		Other considerations specific to this category	
Observed or theoretical problem is identified and accurately described.	ND 1 – 2 – 3 – 4 – 5 NA	Benefits of innovation over existing methods or concepts are clearly and accurately presented.	ND 1 – 2 – 3 – 4 – 5 NA
The presented innovation appropriately identifies a means to minimize impact and counter the threat or problem.	ND 1 – 2 – 3 – 4 – 5 NA	Environmental concerns are addressed as part of the consideration of this innovation.	ND 1 – 2 – 3 – 4 – 5 NA
Type of innovation (construction, procedure, event, etc.) is defined and described appropriately.	ND 1 – 2 – 3 – 4 – 5 NA	The project considers of the tradeoffs between economics, efficiency, and sustainability.	ND 1 – 2 – 3 – 4 – 5 NA
The implementation plan presents a complete description of the innovation.	ND 1 – 2 – 3 – 4 – 5 NA	The project is original and/or innovative in approach or concept, or has original aspects.	ND 1 – 2 – 3 – 4 – 5 NA
The plan for implementation includes planned budgets, timelines, etc.	ND 1 – 2 – 3 – 4 – 5 NA	Further steps beyond the creation of the innovation concept have been taken (e.g. presentation to others, fundraising, publicity materials created, event held, etc.).	ND 1 – 2 – 3 – 4 – 5 NA
Partnerships and/or other required resources are explained in the plan.	ND 1 – 2 – 3 – 4 – 5 NA		
The plan includes a comparison of existing methodologies that are used to correct the problem, including research notes and sources.	ND 1 – 2 – 3 – 4 – 5 NA		

Additional Notes and Comments

Additional Items for Consideration

Safety Considerations	
Team/External Considerations	
Special Category Considerations	

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Invention Category Evaluation**

Display and Documentation		Marketing / Promotional material (if present)	
The invention, its use and the benefits associated are clearly described.	ND 1 – 2 – 3 – 4 – 5 NA	Visual marketing material design is well prepared and presented. Promotional copy (text) is prepared and appropriate for invention.	ND 1 – 2 – 3 – 4 – 5 NA
Target audience or users of invention are identified and have a valid need.	ND 1 – 2 – 3 – 4 – 5 NA	Material is appropriate for target audience	ND 1 – 2 – 3 – 4 – 5 NA
Materials required to build the invention are described and specified.	ND 1 – 2 – 3 – 4 – 5 NA	Marketing plan developed with multiple promotion approaches prepared.	ND 1 – 2 – 3 – 4 – 5 NA
Original design, development, and analysis process explained and/or documented, including descriptions of any problems encountered and their solutions.	ND 1 – 2 – 3 – 4 – 5 NA	Other considerations specific to category	
Construction process clearly defined by drawings and/or descriptive text	ND 1 – 2 – 3 – 4 – 5 NA	The invention addresses a real-world problem or need	ND 1 – 2 – 3 – 4 – 5 NA
Research into competing/similar products is presented and complete.	ND 1 – 2 – 3 – 4 – 5 NA	The invention offers functionality that solves a problem or need efficiently and/or effectively.	ND 1 – 2 – 3 – 4 – 5 NA
Prototype or 'Mock-up'		The Invention is practical in terms of size - cost - materials - etc. for the problem/need being solved.	ND 1 – 2 – 3 – 4 – 5 NA
Prototype is relevant and complete enough to show the important aspects of the invention.	ND 1 – 2 – 3 – 4 – 5 NA	The invention uses unique or innovative methodologies in solving the problem or need.	ND 1 – 2 – 3 – 4 – 5 NA
Parts and components of prototype are described, and their function is identified.	ND 1 – 2 – 3 – 4 – 5 NA	Further steps beyond creation of invention have been initiated or taken (e.g. patents, market research, public presentation, etc.)	ND 1 – 2 – 3 – 4 – 5 NA
Prototype is well designed and constructed.	ND 1 – 2 – 3 – 4 – 5 NA		

Additional Notes and Comments

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Reverse Engineering Category Evaluation**

Display		Other Considerations specific to this category	
Operation of original (assembled) unit is explained adequately	ND 1 – 2 – 3 – 4 – 5 NA	Product selected has appropriate complexity or materials used in the construction.	ND 1 – 2 – 3 – 4 – 5 NA
All disassembled components have been labeled and described accurately	ND 1 – 2 – 3 – 4 – 5 NA	Project scope is reasonable and allows for disassembly to adequate levels.	ND 1 – 2 – 3 – 4 – 5 NA
Function of each part is identified and correct	ND 1 – 2 – 3 – 4 – 5 NA	Disassembly of this product will help the audience understand an unfamiliar operational concept.	ND 1 – 2 – 3 – 4 – 5 NA
Components are presented appropriately to accurately show their location within the completed unit.	ND 1 – 2 – 3 – 4 – 5 NA	Product has been disassembled to accurately represent all components.	ND 1 – 2 – 3 – 4 – 5 NA
The material of composition is identified for each component	ND 1 – 2 – 3 – 4 – 5 NA	Components are identified into sub-assembly groups by purpose (or location).	ND 1 – 2 – 3 – 4 – 5 NA
Descriptive Document (if present)		Cause and effect between and within sub-assemblies is correctly identified.	ND 1 – 2 – 3 – 4 – 5 NA
Images or illustrations of components and how they fit together are presented and appropriate.	ND 1 – 2 – 3 – 4 – 5 NA	Additional steps beyond disassembly are discussed or taken (assembly procedure created, second unit rebuilt, etc.)	ND 1 – 2 – 3 – 4 – 5 NA
Each sub-assembly is defined and its operation explained.	ND 1 – 2 – 3 – 4 – 5 NA	Project shows that the student grasps the purpose of the components and sub-assemblies, and how they work together.	ND 1 – 2 – 3 – 4 – 5 NA
The deconstruction sequence description is complete and accurate.	ND 1 – 2 – 3 – 4 – 5 NA		
Tools used are listed and their use is defined within the sequential listing.	ND 1 – 2 – 3 – 4 – 5 NA		
How the original unit operates based on the disassembled components works is described completely and accurately	ND 1 – 2 – 3 – 4 – 5 NA		

Additional Notes and Comments

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Robotics and Computer Science Category Evaluation**

Display and Documentation		Other Considerations specific to this category	
The entered robot or software is complete and operational, or if a sub-assembly, it is a critical portion that demonstrates operability.	ND 1 – 2 – 3 – 4 – 5 NA	Methods of handling errors or alternative operating parameters (power, environment, etc.) are included in design considerations.	ND 1 – 2 – 3 – 4 – 5 NA
The function and purpose of the entry is clearly explained.	ND 1 – 2 – 3 – 4 – 5 NA	Entry relates to real-world applications	ND 1 – 2 – 3 – 4 – 5 NA
Any sub-components are described and clarified completely.	ND 1 – 2 – 3 – 4 – 5 NA	Entry and/or associated purpose is original or innovative	ND 1 – 2 – 3 – 4 – 5 NA
The means of operation of the robot or software is explained to an appropriate level for the intended audience.	ND 1 – 2 – 3 – 4 – 5 NA	Operation is repeatable and consistent with the planned function	ND 1 – 2 – 3 – 4 – 5 NA
Design information and/or software source code (if provided) is documented and explained adequately.	ND 1 – 2 – 3 – 4 – 5 NA	Overall design is efficient with extraneous components only for aesthetic reasons	ND 1 – 2 – 3 – 4 – 5 NA
		Entry shows completeness of thought and cause and effect are clearly explained.	ND 1 – 2 – 3 – 4 – 5 NA
		Some part of the operational methodology, materials used, and/or design process is innovative or creative in approach.	ND 1 – 2 – 3 – 4 – 5 NA
Physical interface design and functionality			
Physical or interface construction is appropriate and elegant	ND 1 – 2 – 3 – 4 – 5 NA		
Manipulators and/or displays are used as needed to accomplish the desired tasks.	ND 1 – 2 – 3 – 4 – 5 NA		
Operator input and/or physical sensors are appropriate and understandable for the planned purpose.	ND 1 – 2 – 3 – 4 – 5 NA		
Operational methods are complete and appropriate for the stated purpose	ND 1 – 2 – 3 – 4 – 5 NA		

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(*See General Entry Rules and Requirements for further information, ** See Category Description for further information)

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Rube Goldberg Category Evaluation**

Display and Documentation		Sequence of Operation	
Diagram (illustration) is complete and shows operation from initial step to conclusion.	ND 1 – 2 – 3 – 4 – 5 NA	Numerous types of simple machines are used and identified accurately.	ND 1 – 2 – 3 – 4 – 5 NA
Diagram of operation is understandable.	ND 1 – 2 – 3 – 4 – 5 NA	Several types of physical forces are used and identified accurately, including indication of direction.	ND 1 – 2 – 3 – 4 – 5 NA
Sequential steps of progression are clearly labeled.	ND 1 – 2 – 3 – 4 – 5 NA	Duration of sequential events (time) is taken into account as part of sequence.	ND 1 – 2 – 3 – 4 – 5 NA
If a 'mock-up' of a portion of the sequence is presented, it is an important, understandable piece of the whole.	ND 1 – 2 – 3 – 4 – 5 NA	Complexity of steps and quantity of steps are considered in development	ND 1 – 2 – 3 – 4 – 5 NA
Any construction that is presented is built appropriately (including any presented via photo or video).	ND 1 – 2 – 3 – 4 – 5 NA	Multiple converging simultaneous, recurring, or re-useable paths are provided.	ND 1 – 2 – 3 – 4 – 5 NA

Other Considerations specific to this category

Device has a clearly identified task, and a simple trigger event initiates operation.	ND 1 – 2 – 3 – 4 – 5 NA
if construction or video is presented, device runs fully to completion with little to no outside intervention.	ND 1 – 2 – 3 – 4 – 5 NA
Thought was given to reset time and effort required.	ND 1 – 2 – 3 – 4 – 5 NA
Device's construction or purpose has a specific theme	ND 1 – 2 – 3 – 4 – 5 NA
Space used is appropriate and follows guidelines	ND 1 – 2 – 3 – 4 – 5 NA

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Science Fiction Category Evaluation**

Project Production		Other considerations specific to this category	
Writing and/or production standards for the selected media are well done and are appropriate for the project.	ND 1 – 2 – 3 – 4 – 5 NA	Structure of entry is well designed for the intended storyline (may include unusual formatting or unique sequencing).	ND 1 – 2 – 3 – 4 – 5 NA
Dialogue (if used) is used well and flows appropriately	ND 1 – 2 – 3 – 4 – 5 NA	Combinations of entry formats (illustrations with storylines, storyboards with plays, etc.) are well done and appropriate.	ND 1 – 2 – 3 – 4 – 5 NA
Use of details (descriptions, adjectives, etc.) is well done and appropriate.	ND 1 – 2 – 3 – 4 – 5 NA	“Willful suspension of disbelief” effort is almost negligible.	ND 1 – 2 – 3 – 4 – 5 NA
Illustrations or images (if used) are appropriate and add to the story.	ND 1 – 2 – 3 – 4 – 5 NA	Stories (and/or characters) keep the reader’s attention and interest,	ND 1 – 2 – 3 – 4 – 5 NA
Scientific Concepts		Knowledge and understanding of the topic is conveyed.	ND 1 – 2 – 3 – 4 – 5 NA
Use of an alternative scientific idea or concept which is not currently proven is important to the storyline of the entry.	ND 1 – 2 – 3 – 4 – 5 NA		
Alternative thought process or physical rules are clearly expressed (but not necessarily described in detail).	ND 1 – 2 – 3 – 4 – 5 NA		
Alternative rules are consistent throughout the story.	ND 1 – 2 – 3 – 4 – 5 NA		
Alternative rules or thought processes are derived from existing physical laws and/or current scientific principles.	ND 1 – 2 – 3 – 4 – 5 NA		

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Scientific Inquiry Category Evaluation**

Display and Documentation		General Process and Scientific Method	
Describes how/why the inquiry was formed and development of a hypothesis	ND 1 – 2 – 3 – 4 – 5 NA	The purpose or problem clearly explains what is going to be experimented	ND 1 – 2 – 3 – 4 – 5 NA
Investigation procedure is clearly explained.	ND 1 – 2 – 3 – 4 – 5 NA	Appropriate and complete research was conducted	ND 1 – 2 – 3 – 4 – 5 NA
Materials listed with units of measure (consistently), graphs, data tables etc. labeled correctly, data is summarized	ND 1 – 2 – 3 – 4 – 5 NA	Hypothesis shows a relationship between independent and dependent variables	ND 1 – 2 – 3 – 4 – 5 NA
Results/Summary of data is clearly stated and addresses ALL variables	ND 1 – 2 – 3 – 4 – 5 NA	Procedure description shows what observations will be made, what data will be collected, defines the number of trials, lists variables and control items	ND 1 – 2 – 3 – 4 – 5 NA
Other considerations specific to category		Procedure is sequential, replicable, provides a control and variables and was repeated for validity.	ND 1 – 2 – 3 – 4 – 5 NA
Peer/scientific Review	ND 1 – 2 – 3 – 4 – 5 NA	Qualitative (observations) and quantitative (recorded data) observations are used and recorded.	ND 1 – 2 – 3 – 4 – 5 NA
Understanding of how the inquiry relates to broader scientific principles and real world application.	ND 1 – 2 – 3 – 4 – 5 NA	Record of experiment includes observations, appropriate use of terms and measurement, analysis and reflections	ND 1 – 2 – 3 – 4 – 5 NA
The idea for investigation is original or innovative	ND 1 – 2 – 3 – 4 – 5 NA	Conclusion relates to the problem statement and incorporates results/the data supports or doesn't support the hypothesis, lists possible sources of error, and unresolved questions	ND 1 – 2 – 3 – 4 – 5 NA
The procedure, materials, trial length, etc. are innovative or creative in approach	ND 1 – 2 – 3 – 4 – 5 NA		
Offers advancement of understanding of scientific principles and/or the world around us	ND 1 – 2 – 3 – 4 – 5 NA		
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