



Project Display Requirements and General Judging Criteria Evaluation*

Presentation Display and Documents (if Present)		General Judging Criteria	
Attractive, easy to read, and layout is in appropriate logical order	ND 1 - 2 - 3 - 4 - 5 NA	Organization and Completeness	ND 1 - 2 - 3 - 4 - 5 NA
Shows project in appropriate detail for understanding by audience	ND 1 - 2 - 3 - 4 - 5 NA	Clarity	ND 1 - 2 - 3 - 4 - 5 NA
Visual aids promote understanding	ND 1 - 2 - 3 - 4 - 5 NA	Comprehension	ND 1 - 2 - 3 - 4 - 5 NA
Thorough, without extraneous data	ND 1 - 2 - 3 - 4 - 5 NA	Effort and Motivation	ND 1 - 2 - 3 - 4 - 5 NA
		Originality / Innovation	ND 1 - 2 - 3 - 4 - 5 NA
		Elegance and Artistry	ND 1 - 2 - 3 - 4 - 5 NA

Science and Engineering Practices**

Ask questions/Define problems	ND 1 - 2 - 3 - 4 - 5 NA	Develop and use models	ND 1 - 2 - 3 - 4 - 5 NA
Plan and carry out investigations	ND 1 - 2 - 3 - 4 - 5 NA	Analyze and interpret data	ND 1 - 2 - 3 - 4 - 5 NA
Use math and computational thinking	ND 1 - 2 - 3 - 4 - 5 NA	Construct explanations/Define solutions	ND 1 - 2 - 3 - 4 - 5 NA
Engage in argument from evidence	ND 1 - 2 - 3 - 4 - 5 NA	Obtain, evaluate, communicate information	ND 1 - 2 - 3 - 4 - 5 NA

Category Specific Evaluation **

Display and Documentation		Sequence of Operation	
Diagram (illustration) is complete and shows operation of the contraption 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 correctly, 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 the 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 and quantity of steps are considered during development	ND 1 - 2 - 3 - 4 - 5 NA
Any construction that is presented is built appropriately (including any which is presented by 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 the operation	ND 1 - 2 - 3 - 4 - 5 NA
if construction or video is presented, the 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

Additional Notes and Comments

Additional Items for Consideration

Safety Considerations

Team/External Considerations

Special Category Considerations

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Category Specific Evaluation **

Display and Documentation	
Describes how/why the inquiry was formed and explains the development of the hypothesis	ND 1 - 2 - 3 - 4 - 5 NA
The investigation procedure is clearly explained	ND 1 - 2 - 3 - 4 - 5 NA
Materials are listed with units of measure (consistently), graphs, data tables, etc are labeled correctly, data is summarized	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

General Process	
The purpose or problem is clearly defined	ND 1 - 2 - 3 - 4 - 5 NA
Hypothesis shows a relationship between independent and dependent variables	ND 1 - 2 - 3 - 4 - 5 NA
Investigation 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
Procedure is sequential, replicable, provides controls and variables, and was repeated for validity	ND 1 - 2 - 3 - 4 - 5 NA
Qualitative (observation) and quantitative (data) information is used and recorded	ND 1 - 2 - 3 - 4 - 5 NA
Documentation and record of experiment has appropriate use of terms, measurement, analysis, and reflections	
Conclusion relates to the initial statements and incorporates results showing that the data supports (or doesn't support) the hypotheses. It lists possible sources of error and unresolved questions	ND 1 - 2 - 3 - 4 - 5 NA

Other considerations specific to this category	
Original or innovative aspect present and described. Previous work credited.	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
Offers advancement in the understanding of the world around us and/or scientific principles	ND 1 - 2 - 3 - 4 - 5 NA
Log Book/Journal is complete and thorough	ND 1 - 2 - 3 - 4 - 5 NA
Appropriate and complete research was conducted	ND 1 - 2 - 3 - 4 - 5 NA

Additional Notes and Comments

Additional Items for Consideration

Safety Considerations

Team/External Considerations

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Display and Documentation	General Process
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The investigation procedure is clearly explained	Hypothesis shows a relationship between independent and dependent variables
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Results/Summary of data is clearly stated and addresses all variables	Procedure is sequential, replicable, provides controls and variables, and was repeated for validity
Other considerations specific to this category	Qualitative (observation) and quantitative (data) information is used and recorded
Original or innovative aspect present and described. Previous work credited.	Documentation and record of experiment has appropriate use of terms, measurement, analysis, and reflections
Understanding of how the inquiry relates to broader scientific principles and real-world application	Conclusion relates to the initial statements and incorporates results showing that the data supports (or doesn't support) the hypotheses. It lists possible sources of error and unresolved questions
Offers advancement in the understanding of the world around us and/or scientific principles	
Log Book/Journal is complete and thorough	
Appropriate and complete research was conducted	

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Category Specific 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	Structure of entry is well designed for the intended storyline or concept (may include unusual formatting or unique sequencing)
Dialogue (if used) is used well and flows appropriately	Combinations of entry formats (illustrations with storylines, storyboards with plays, etc.) are well done and appropriate
Use of details (descriptions, adjectives, etc.) is well done and appropriate	"Willful suspension of disbelief" effort is almost negligible
Illustrations, images, or other media (if used) are appropriate and add to the story.	Stories, visions, and/or characters keep the reader's attention and interest
	Knowledge and understanding of the topic is conveyed.
Scientific Concepts	
Use of an alternative scientific idea or concept, which is not currently proven, is important to the piece	
Alternative thought process or physical rules are clearly expressed (but not necessarily described in detail).	
Alternative rules are consistent throughout the story	
Alternative rules or thought processes are derived from existing physical laws and/or current scientific principles	

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Category Specific Evaluation **

Project Type: <input type="radio"/> Invention <input type="radio"/> Reverse Engineering		Display and Documentation	
Considerations specific to Invention		There is a clear definition of the problem the device or product was created to solve.	ND 1 - 2 - 3 - 4 - 5 NA
Invention addresses a real-world problem or need	ND 1 - 2 - 3 - 4 - 5 NA	The target audience (expected users) for the device are identified and have a need.	ND 1 - 2 - 3 - 4 - 5 NA
Further steps beyond creation of invention have been initiated or taken (e.g. patents, market research, public presentations, etc.)	ND 1 - 2 - 3 - 4 - 5 NA	Components (materials/sub-components) of the device are correctly identified, and their functions are described accurately	ND 1 - 2 - 3 - 4 - 5 NA
Prototype or 'mock-up' is relevant and complete enough to show the important aspects of the invention	ND 1 - 2 - 3 - 4 - 5 NA	Images or illustrations of components and how they fit together (if present) are explanatory and appropriate	ND 1 - 2 - 3 - 4 - 5 NA
Prototype is well designed and constructed	ND 1 - 2 - 3 - 4 - 5 NA	The construction (and/or deconstruction) sequence is described, complete, accurate, and includes tools required/used.	ND 1 - 2 - 3 - 4 - 5 NA
Considerations specific to Reverse Engineering		Research on similar products is presented	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	Marketing material (if presented) appropriately helps explain the operation or purpose of the device	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		
Product selected has appropriate complexity to allow understanding without being overly simple	ND 1 - 2 - 3 - 4 - 5 NA		
Cause and Effect between and within sub-assemblies is correctly identified	ND 1 - 2 - 3 - 4 - 5 NA		
Evaluated methods and concepts to improve the disassembled product	ND 1 - 2 - 3 - 4 - 5 NA		

Additional Notes and Comments

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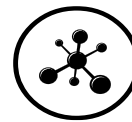
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Other considerations specific to this category		Documentation and record of experiment has appropriate use of terms, measurement, analysis, and reflections	
Original or innovative aspect present and described. Previous work credited.	ND 1 - 2 - 3 - 4 - 5 NA	Conclusion relates to the initial statements and incorporates results showing that the data supports (or doesn't support) the hypotheses. It lists possible sources of error and unresolved questions	ND 1 - 2 - 3 - 4 - 5 NA
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Additional Notes and Comments

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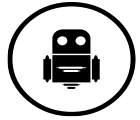
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Category Specific Evaluation **

Display and Documentation	Other considerations specific to this category
The entered robot or software is complete and operational, or if a sub-assembly, is a critical portion that demonstrates function and operability	Methods of handling errors or alternative operating parameters (power, environment, etc.) are included in design considerations
The function and purpose of the entry is clearly explained	Operation is repeatable and consistent with the planned function
Any sub-components are described and clarified completely	Overall design is efficient with extraneous components only for aesthetic reasons
The means of operation of the robot or software is explained to an appropriate level for the intended audience	Entry shows completeness of thought and cause and effect are clearly explained
Design information and/or software source code (if provided) is documented and explained adequately	Entry relates to real-world applications

Physical/Interface and design 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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Category Specific Evaluation **

Display and Documentation	
The description of the thing being made is adequate and complete	ND 1 - 2 - 3 - 4 - 5 NA
Documentation adequately describes materials and tools needed for construction	ND 1 - 2 - 3 - 4 - 5 NA
Object, component, or representation of the object is presented so as to adequately show the details of the project	ND 1 - 2 - 3 - 4 - 5 NA
Design and build process is described in enough detail to show the complexity involved in making the thing	ND 1 - 2 - 3 - 4 - 5 NA

Other considerations specific to this category	
Function/Practicality	ND 1 - 2 - 3 - 4 - 5 NA
Complexity of the build process or engineering design process	ND 1 - 2 - 3 - 4 - 5 NA
Offers advancement in the understanding of the world around us and/or scientific principles	ND 1 - 2 - 3 - 4 - 5 NA

The thing itself	
Completeness of concept and design	ND 1 - 2 - 3 - 4 - 5 NA
If component(s), model(s), mock-up(s), or representations are presented, they adequately show the details of the completed (whole) unit.	ND 1 - 2 - 3 - 4 - 5 NA
Originality of work is apparent and viable. If derivative work, original components are recognized	ND 1 - 2 - 3 - 4 - 5 NA
Quality of workmanship of the thing and/or of the involved design components is elegant and well done	ND 1 - 2 - 3 - 4 - 5 NA

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