

**Scientific Projects**

**SUGGESTED JUDGING CRITERIA**

**Engineering Projects**



***ORIGINALITY & CREATIVITY***



Original scientific hypothesis (not re-inventing the wheel)	Original engineering objective (not re-inventing the wheel)
For lower grades “original” can mean something new to the student, not necessarily new to the world	
Innovative methods and materials (If appropriate)	Innovative design or solution

***UTILITY***

Contributes useful knowledge to basic or applied research	Creates or improves useful technology or product
Creates or improves scientific techniques	Economic and feasible solution

***CLARITY OF COMMUNICATION***

Clearly stated scientific hypothesis	Clearly stated engineering objective
Clearly described methods and materials	Clearly described engineering design and test methods
Clearly labeled and structured results (graphs, charts, etc.)	Clearly labeled and structured test data (graphs, charts, etc.)
Clearly stated conclusions	Clearly described utility of the product or solution

***ESSENTIAL COMPONENTS (Scientific Method)***

It involves experimentation, not just writing a term paper	It involves design and testing, not just writing a term paper
Experimental variables are recognized	Design and testing variables are recognized
Experimental points are repeated (N > 1)	Testing is repeated (N > 1)
Sufficient data to draw meaningful conclusions	Sufficient test results to evaluate performance
Methods are appropriate for achieving meaningful data	Methods are appropriate for evaluating design or product
Positive and negative controls (if available)	Testing done under conditions of intended use
Sufficient background research	
Data logs show sufficient records	
Statistics are employed (Higher grades), e.g. P values, std. error, etc.	

***SKILL***

Skill shown in designing and performing experiments	Skill shown in designing and performing testing
Effective analysis of data	Effective analysis of test results

***THOUGHTFULNESS***

Understands literature and background in relation to project as evidenced by written and oral presentation

Scope sufficiently focused (limited) to allow plausible approach

Recognizes limitations of available methods and equipment

Farsightedness: Has considered what could be done next

Correct or reasonable interpretation of results

Problem-solving, trouble-shooting ability

***INITIATIVE & EFFORT***

Appropriate level of parental / mentor involvement

Seeking resources: materials, equipment, training

Persistence in the face of initial failure

Persistence when resources are limited

Age-appropriate complexity

Appropriate level of time and effort

***TEAMWORK***

Equitable contribution of each team member

Equal understanding of project by each team member

Effective coordination of team members' assignments



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