Lee Academy Analytic Rubric

Physics Stream Crossing Project

Name: ____________ Date: ____________

Class : ____________ Marking Period: ____________

NGSS	Criteria	Wt	4 Exceeds Standard	3 Meets standard	2 Partially Meets Standard	1 Does not Meet Standard	Value
HS-ETS1-2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	Background	40%	Student researches and insightfully explains factors that affect stream crossing design and how forces and the transfer of momentum impact stream crossings.	Student researches and explains factors that affect stream crossing design and how forces and the transfer of momentum impact stream crossings.	Student researches and partially explains factors that affect stream crossing design and how forces and the transfer of momentum impact stream crossings.	Student researches and describes factors that affect stream crossing design and how forces and the transfer of momentum impact stream crossings, with several gaps and/misunderstandings.	
	Procedure	40%	Student provides a comprehensive description of how each crossing was built. Procedure demonstrates creative problem solving.	Student provides a comprehensive description of how each crossing was built. Procedure demonstrates problem solving.	Student provides a description of how each crossing was built, but procedure is missing some steps and/or demonstrates limited problem solving.	Student provides a description of how each crossing was built, but procedure is limited and/or does not demonstrate problem solving.	
	Blue Print	20%	Student provides detailed blue prints for each crossing with all forces acting on each crossing accurately labeled.	Student provides blue prints for each crossing with all forces acting on each crossing accurately labeled.	Student provides blue prints for each crossing but some forces are not labeled.	Student provides limited blue prints for each crossing and/or several forces are not labeled.	

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.	Bridge Structure and Testing	40%	Models are structurally sound, meet materials requirements, and are within required dimensions. Models demonstrate innovative design.	Models are structurally sound, meet materials requirements, and are within required dimensions.	Models are structurally sound, but do not meet materials requirements, and/or are not within required dimensions.	Models are not structurally sound, do not meet materials requirements, and/or are not within required dimensions.	
	Hypothesis	20%	Student predicts which model will support the greatest load while having the least impact on stream-flow and erosion and demonstrates in-depth analysis with supporting statements to justify prediction.	Student predicts which model will support the greatest load while having the least impact on stream-flow and erosion and demonstrates analysis with supporting statements to justify prediction.	Student predicts which model will support the greatest load while having the least impact on stream-flow and erosion and demonstrates limited analysis with supporting statements to justify prediction.	Student provides limited prediction of which model will support the greatest load while having the least impact on stream-flow and erosion and/or does not provide supporting statements to justify prediction	
	Conclusion	40%	Student provides insightful evaluation of which model was most successful at supporting a load and withstanding erosion while being the most cost effective. Student discusses and analyzes sources of error, how to improve crossings, and what was learned from this project..	Student provides evaluation of which model was most successful at supporting a load and withstanding erosion while being the most cost effective. Student discusses sources of error, how to improve crossings, and what was learned from this project.	Student provides partial evaluation of which model was most successful at supporting a load and withstanding erosion while being the most cost effective. Student provides incomplete discussion of sources of error, how to improve crossings, and what was learned from this project.	Student provides limited evaluation of which model was most successful at supporting a load and withstanding erosion while being the most cost effective. Student provides limited discussion of sources of error, how to improve crossings, and what was learned from this project.	
MP.2 Reason abstractly and quantitatively.	Results	100 %	Student demonstrates logical problem solving while accurately showing all measurements and calculations needed to determine the net force on, transfer of momentum to, and effects of erosion from each model. Units are accurately provided. Data is well organized.	Student accurately shows all measurements and calculations needed to determine the net force on, transfer of momentum to, and effects of erosion from each model. Units are accurately provided.	Student shows all measurements and calculations needed to determine the net force on, transfer of momentum to, and effects of erosion from each model with some errors and/or units are not accurately provided.	Student shows some measurements and calculations needed to determine the net force on, transfer of momentum to, and effects of erosion from each model with several errors. Units are not accurately provided.	

Final Score for Each Standard HS-ETS1-2: HS-ETS1-3: MP.2:							

Teacher's Comments

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*When converting to a traditional numeric grade, HS-ETS1-2 and HS-ETS1-3 are weighted twice and MP.2 is weighted once.