

Hydroelectric Power: Practitioner Column

	Novice	Apprentice	Practitioner	Expert
Solution Design			<ul style="list-style-type: none"> • includes a solution to a complex real-world problem, based on a wide variety of scientific knowledge • demonstrates effective use of the design process and scientific method • includes a wide variety of student-generated sources of evidence, including competing ideas and evidence • includes prioritization of criteria and tradeoff considerations 	
Explanation			<ul style="list-style-type: none"> • detailed proposal with maps, images, data tables, and/or other illustrative examples • ample, relevant, cited textual evidence to support the need for both the waterfall and the hydroelectric power source • includes proposal evaluation that considers a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts 	
STEM Connections			<ul style="list-style-type: none"> • includes scientific knowledge through sources and experiments to support both the need and the solution • includes use of technology for modeling and exploring “what if?” scenarios • includes engineered 3-D prototype of solution • includes a mathematical analysis of costs and benefits as a critical aspect of decision-making 	
Human Impacts on Earth Systems			<ul style="list-style-type: none"> • details the sustainability of human societies and the biodiversity that supports them through the responsible management of natural resources • highlights the contribution the proposal makes to society by producing less pollution and waste and precluding ecosystem degradation 	