

Program-Title	Zia Spacecraft Recovery & Bayes Theorem		STEM Inventory	Entry# 315
Org-Type	Higher-Education-based			
Lead	Ohlone Community College	PoC	Eric Brachhausen	
PoC-Phone	510-773-0749	PoC-Email	ebrach1@mac.com	
Address	7736 Hazelnut Dr. Newark, CA 94560			
URL				
Service-Region	Nationwide			
Type	Lesson Plan			
Subjects	Math			
Level	Undergraduate			
Other-Objectives	Collaborative problem-solving			
Served-per-Year	50	Demographics		
Content	<p>The program consists of a lecture and an associated in-class simulation of a search for a Martian space probe lost upon return to earth. The lecture portion develops the foundation for Bayes Theorem, and credits John P. Craven for his work in using Bayes Theorem to locate a lost atomic bomb and a missing nuclear submarine. The simulation portion involves two in-class teams who must collaborate to progressively establish the most probable search area for locating the space probe. The instructor supplies the basic scenario and initial conditions. The class digests this information and comes up with their initial probability estimates, which they feed into an electronically projected spreadsheet tool. This tool shows the results of the students' search pattern, while the instructor reports search results using a separate display on the classroom wall. Ultimately the students either locate the space probe within a set resource limit, or not. Either way they are rewarded with a previously constructed positive conclusion to the scenario. The entire exercise takes approximately 1 hour, including the presentation of Bayes Theorem.</p>			
Outcomes	<p>Understanding the power of Bayes Theorem to combine past probabilities with current data to reach a new and improved estimate of probability; hands-on collaborative experience applying the theorem instead of being confined to solving equations; experiencing the novelty of being designated as a spacecraft recovery team and having to deal with imperfect information being supplied in real time to make the best estimate possible.</p>			
Started	Fall 2008	Funded-Through	Spring 2009	
Length	One-time	Cost	\$50 materials	
Primary-Funding	Academia	Primary-\$	None	
Materials	Powerpoint slides, Excel spreadsheet, Word documents, description of conducting scenario.			
Other-Funding	No.			
How-Assessed	Informal feedback from students.			
Best-Practice-Why	Requires further evaluation.			
Promising-Practice	Yes, but this depends on greater distribution and peer feedback.			
Sponsor	Eric Brachhausen	Sponsor-Org	Ohlone College	
Sponsor-Phone	510-773-0749	Sponsor-Email	ebrach1@mac.com	
Other-Orgs	Spaceport America Institute			