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JAN 17 2007

# GOOD IDEA GRANT APPLICATION

## 2007- 2008

Applicant **BETTY BRASK**  
Home Address  
City, State  
Email address **braskb001@hawaii.rr.com**

Position at school 4th grade classroom teacher  
School Pukalani Elementary School  
School address 2945 Iolani  
City, State Pukalani, Hawaii 96768  
School phone number 573-8760

Project title **GOLDBERG CHALLENGE**  
Participants 30 4th grade students  
Subject areas science, technology, language arts, math

### **3. SPECIFIC OBJECTIVES**

Using a teacher developed rubric, students will demonstrate their proficiency in the following HCPS III standards through oral reports, written reports and hands-on activities and experiments, group and individual projects. Teacher observation/evaluation will be used throughout the hands-on challenges and experiments. A pre and post test will be administered to all students. Students will answer the post test with 90% accuracy or better. Teacher generated rubrics will indicate proficiency levels of understanding of targeted concepts. Student and classroom graphs will be generated showing a proficiency of understanding. (*Evaluation*)

***Science Standard 1 : The Scientific Process : Scientific Investigation: Discover, Invent, and Investigate using skills necessary to engage in the scientific process.***

Scientific Inquiry - Students will describe, in a printed format, a testable hypothesis and the experimental procedure they used to test their hypothesis.

Scientific Knowledge - Students will explain the difference between an observation and an inference and give examples.

***Science Standard 2: The Scientific Process: Nature of Science: Understand that science, technology and society are interrelated.***

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***Science Standard 6: Physical, Earth and Space Sciences: Nature of Matter and Energy: Understand the nature of matter and energy, forms of energy and energy transformations, and their significance in understanding the structure of the universe.***

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***Math Standard 4: Measurement: Fluency with Measurement: Understand attributes, units and systems of units in measurement; and develop and use techniques, tools and formulas for measuring.***

Students will select and apply appropriate customary and metric units and tools to measure length, perimeter and area for accuracy.

***Math Standard 10: Patterns, Functions and Algebra Symbolic Representation: Use symbolic forms to represent, model and analyze mathematical situations.***

Students will describe the rate of change numerically and verbally based on data recorded in a table or graph with accuracy.

***Math Standard 12: Data Analysis, Statistics and Probability: Statistics: Interpret data using methods of exploratory data analysis .***

Students will compare related data sets with a emphasis on how the data is distributed with 90% accuracy.

Different learning styles will be addressed through activities using visual/spatial, logical/mathematical. kinesthetic, interpersonal/interpersonal intelligences. Students will be challenged with activities building on higher level thinking skills such as: knowledge, comprehension, application, analysis, synthesis and evaluation.

**.4. PROJECT DESCRIPTION**

**a) DOE Priorities - General Learner Outcomes**

**Self Directed Learner** - Students will set challenging, achievable goals and personal plans for learning. Students will consistently set priorities to set achievable goals. Students will consistently plan and manage time and resources to achieve their goals in an efficient manner. Students will consistently use a variety of credible and relevant resources to achieve their goals. Students will consistently check their progress and learning experiences to resolve any problem that might be interfering with their learning.

**Community Contributor** - Students will consistently listen and consider other points of view and ask appropriate questions for clarification and understanding. Students will cooperate with, help and encourage other in group situations. Students will make positive contributions toward achievement of the group's goals.

**Complex Thinker** - Students will consistently demonstrate the use of prior knowledge to acquire new knowledge or develop new skills. Students will demonstrate thorough analysis and evaluation of major points of view in analyzing and solving problems. Students will consistently apply creative thinking to generate ideas and approaches to solving problems. Students will consistently apply critical thinking to evaluate solutions based on solid information and change position when evidence and reasons are sufficient.

**Quality Producer** - Students will identify and describe the criteria and performance standards of their products and their performances. Students will consistently demonstrate clear understanding of the learning goals and task requirements. Students will set criteria and clear goals to meet and exceed HCPS Standards. Students will consistently demonstrate in-depth understanding, knowledge and skill necessary to product a quality product and performance. Students will monitor their progress and use feedback, criticisms and suggestions to improve work. Students will remain of task and demonstrate perseverance to complete a product and performance.

**Effective Communicator** - Students will consistently solicit and actively listen to the ideas and opinions of others. The students will consistently communicate information with logic and coherence. The intended purpose for their communication will be explicit and all major points will be fully elaborated. Students will consistently demonstrate thorough understanding and meaning from text. Students will consistently seek information through

reading various types of written materials. Students will make predictions and draw accurate inferences. Students will demonstrate writing that appears to say what the writer thinks and feels showing conviction. Students will use words that are precise and imaginative. Students will make observations and will draw logical inferences and conclusions based on their observations.

**Effective and Ethical Users of Technology** - Students will consistently and accurately use a variety of technologies to access and manage information. They will use tools that demonstrates excellence in presentation and content. Students will use multimedia, electronic devices, e-mail and/or internet to expand beyond the barriers of our classroom. Students will use biographies supplied through this grant to study Rube Goldberg. Students will use our school media center and computer lab for research.

Students will meet and exceed the science, math and language arts standards described through this project. They will also meet and exceed the DOE General Learner Outcomes. Teacher observations and checklists will indicate "approaches or meets and/or exceeds expectations".

## **NEW AND INNOVATIVE PROJECT MAJOR ACTIVITIES**

### **RUBE GOLDBERG MACHINE CONTEST**

**" A Rube Goldberg Machine Contest brings Goldberg's cartoons to life in a way that pulls students away from traditional ways of looking at problems and sends them spinning into the intuitive, chaotic realm of imagination. The resulting inventions are collections of bits and pieces, part of now useless machines, scraped together to achieve an innovative, imaginative, yet somehow logical contraption to conquer the job at hand".**

This project will integrate language arts, science and math. Students will progress through a series of sequential, developmentally appropriate, standards based lessons on physical science, reading, research and technical writing.

I will introduce this unit with an exciting group activity using the Energy Balls. This is a graphic lesson that demonstrates open and closed circuits. It will excite and engage the students as they continue to learn about conductors, insulators and more.

Initially, students will complete a wide variety of hands-on experiments using and manipulating components necessary to create electric circuits. They will develop an understanding of open and closed circuits, simple series and parallel circuits, resistance, conductors, insulators, currents, etc. Materials needed to create circuits, such as battery holders, alligator clips, lamp sockets, bulbs bell wire and switches, will be supplied through this grant.

Teams will work through a series of challenges as they develop, test and internalize the physical science concepts targeted in this grant. Team challenges will be developed

using inquiry based instruction. I will follow the sequential activities described in the AIMS teacher resource book and challenges found in other resources.

Students will then be challenged to work through a wide variety of activities using Electronic Snap Circuits provided through this grant. There are over 300 different challenges , projects and experiments. Students will successfully build FM and AM radios, digital voice recorders, burglar alarms, doorbells and more. This will focus the students on higher level thinking skills, such as application, analysis, synthesis and evaluation.

The teacher will introduce the game MOUSETRAP. The students will have the opportunity to experiment with this game that illustrates Rube Goldberg's challenge.

Students will next research the American cartoonist, Rube Goldberg using a variety of resources, technology and biographical books. Two of the biographies will be supplied through this grant. They will research Goldberg's ideas about "**man's capacity for exerting maximum effort to accomplish minimal results.**" They will prepare and present reports, technical drawings and diagrams indicating their understanding of his premise/vision - "a comically involved, complicated invention, laboriously contrived to perform a simple operation (Webster's new Word Dictionary)They will study and draw their own inventions illustrating Goldberg's challenge to make an "**exceedingly complex devices that perform simple tasks in a very indirect and convoluted way.**" They will explore and investigate engineering and its vast possibilities. They will also see the future possibilities for them.

Teams will then work in together to create an Goldberg invention using materials supplied in the classroom through this grant. Teams will present, discuss and explain their engineering marvel! This will be an open ended challenge, with the students deciding what task they are going to complete.

Students will be given a final challenge, THE GOLDBERG MACHINE CHALLENGE. This project will be completed at home with parental help. The challenge will be to construct a machine that uses 20 steps to to complete an assigned task. The task will be to light a light bulb using materials from home and the materials they initially experimented with (energy balls, lamp sockets, bulbs, battery holders and alligator clips

Students will present their Goldberg Machine at a culminating celebration. A variety of community and school dignitaries will be invited. Students will demonstrate and test their machine, explain how it was created, analyze the challenges they faced, and share a self evaluation.

Through this study, the students will gain a deep understanding of the concepts presented. Their projects will indicate embedded learning of the targeted goals.

## **INSTRUMENTS TO MEASURE OBJECTIVES**

Rubrics will be developed to indicate the individual's proficiency ( advanced, proficient, partially proficient and novice).

Students will complete an initial pretest indicating their level of understanding. The

post test will be scored and compared with their new level of understanding upon completion of the unit study. Students will score 90% or higher on the post test.

A graph will be created to comparing the students pre and post test scores.

Students will create individual portfolios and personal journals showing their investigations as they proceed through the challenges.

Portfolios will be scored by a teacher developed rubric. Students will meet and exceed criteria for proficiency.

### PROJECT BUDGET

<u>Item description</u>	<u>Source</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>SubTotal</u>
Energy balls	Steve Spangler Science	30	\$5.00	\$150.00
Battery Holders				
Alligator clips	Steve Spangler Science	30	\$5.00	\$150.00
Bell wire and Switch	Steve Spangler Science	30	\$4.00	\$120.00
Lamp socket and bulbs	Steve Spangler Science	30	\$4.00	\$120.00
Snap Circuit Kits	Steve Spangler Science	30	\$60.00	\$1,800.00
Consumable materials for team challenge	Wal Mart, COSTCO		\$75.00	\$75.00
Mousetrap game	Kay B Toys	4	\$25.00	\$100.00
Resource Books	AIMS	1	\$50.00	\$50.00
Rube Goldberg				

Invention Books	Rube Goldberg, Inc.	1	\$20.00	\$20.00
Rube Goldberg				
Resource Book	Rube Goldberg, Inc.	1	\$30.00	\$30.00
Shipping and handling (approximately)				\$275.00
Batteries	Costco		\$100.00	\$100.00
<b>TOTAL REQUEST</b>				<b><u>\$3000.00</u></b>

All the above consumable materials will be used throughout the teaching unit as described above in the project description to implement THE GOLDBERG CHALLENGE. Each sequential lesson, is centered around hands-on activities.

Public Schools of Hawaii Foundation  
Good Idea Grant Evaluation  
2007-2008

Name: Betty Brask

Position: teacher School: Pukalani District: Maui

Project Title: Rube Goldberg Challenge

Amount Funded: \$ 3000<sup>00</sup> No. of Students: 30

1. State your project objectives as indicated in your project request.

*see attached documents*

2. Were your objectives met or not? Please describe.

3. Will this project be continued or not? Please check where applicable and provide an explanation for your response.

- will be continued  
 will be continued with modifications  
 will not be continued

4. Can your project/idea be applied at other schools?

5. How did you hear about this grant program?

4. Why did you apply to the Public Schools of Hawaii Foundation for a Good Idea Grant?

5. Provide an expenditure report using the project budget you initially proposed and attach all receipts (see attached form).

6. Do you have any suggestions on improving the grant making process?

Date due: **June 30, 2008**

Mail to: Public Schools of Hawaii Foundation  
P.O. Box 4148  
Honolulu, HI 96812

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2. Were your objectives met or not? Please describe.

The objectives of this grant were met. Students exceeded my expectations in all areas measured and formally tested. 100% of the students completed the written reports, completed diagrams and built successful, working models for the Goldberg challenge. Targeted concepts were mastered as indicated through the testing and observation process. Students used self assessment to personally evaluate their progress. The rubrics developed for the students and teacher evaluation were effective and showed continued growth in 100% of the students. 100% of the student research projects demonstrated mastery of the targeted objectives.

3. Will this project be continued or not?

4. Can this project /idea be applied at other schools?

This project could easily be used in other schools and grade levels. The students become engaged quickly as they learn about Rube Goldberg, play the Mousetrap game, work their way through the design process and work on team and individual projects. The only concern would be the cost involved in purchasing the Snap Circuit educational kits. The project could be completed without that specific component of the grant.

I worked very hard to search out the same materials targeted in this grant, at the least possible cost and shipping. Because of this effort, I will be able to continue this grant in its entirety next year.

5. How did you hear about this grant program?

I have applied for Good Idea grants in the past. Our principal, Chad Okamoto, announces information about Good Idea Grants program to our faculty as soon as information is received. He reminds us about this opportunity as the deadline approaches.

4. Why did you apply to the Public Schools of Hawaii Foundation for a Good Idea Grant?

Unfortunately with NCLB, HSA testing, and limited funds for classroom expenditures, teacher's hands are often tied as to what innovative and enrichment units we can teach. Each year, the announcement of the Good Ideas Grant program inspires me to teach above and beyond the benchmarks. It allows me to create a unique learning environment that allows children to "dare to dream". Thank you for your efforts to make this opportunity available to Hawaii's educators. You have helped make a positive difference in many lives.

5. See attached documents.

5. Do you have any suggestions on improving the grant making process?

This is an extremely teacher friendly grant application. I think it is non threatening to time taxed educators. It is very straight forward. I look forward to the opportunity each year. I look for innovative programs that I would like to implement, knowing that I might be able to afford the program because of the Good Idea Grant! Thank you!

