

Grant Example 1 (Project)

Arkansas Space Grant Consortium

University of Arkansas at Little Rock
 2801 S. University, ETAS 329, Little Rock, AR 72204
 Dr. Keith Hudson, Director
 Ms. Schyler Cannatella, Education and Outreach Coordinator
 Ms. Laura Holland, Finance Coordinator

Phone: 501 569 8213 Fax: 501 569 8039 Email: asgck12@gmail.com web: <http://asgc.ualr.edu>

K-12 Grant Application

Date: 3/18/2014

Project Title: 5...4...3...2...1... We Have Liftoff!

Institution: West Point High School	Street/Box No: 114 West Side Street	City/State: West Point/AR	Zip: 72145
Names of Persons Involved:	Title:	Department:	E-mail:
1. Susan Smart	Physics Teacher	Science	ssmart@westpoint.edu
2.			
Telephone No: (501) 548-9856	Fax No: (501) 748-6589	Best Contact Time: 8:00 AM - 5:00 PM	

Names of Schools Involved:	Address:	Zip:	Contact:
1. West Point High School	114 West Side Street	72145	Susan Smart
2.			
Contact:	Contact Phone:	Contact Fax:	Contact Email:
Susan Smart	(501) 548-9856	(501) 748-6589	ssmart@westpoint.edu

Brief Summary of Project: (See Guidelines):

The students will be demonstrating a Helicopter Liftoff, and how the speed of the rotor will affect the amount of lift for the Helicopter. The students will measure the rate of the blade rotation on a remote-controlled helicopter. They will then use this information to determine how this rate affects the vertical motion of the helicopter. The students will then add weights to the helicopter and measure how this weight changes the lift of the helicopter. The project will be an in-classroom learning experience, with the students learning hands-on.

Summary of Funds Requested: (Please attach a detailed budget)

	ASGC:	Match:	Total:
1: Materials and Supplies:	\$ 200	\$ 200	\$ 400
2: Travel:	\$	\$	\$ 0
3: Other:	\$	\$	\$ 0
4: Other: _____	\$	\$	\$ 0
5: Other: _____	\$	\$	\$ 0
6: Other: _____	\$	\$	\$ 0
Total:	\$ 200	\$ 200	\$ 400



Signature

Project Title: 5.4.3.2.1 We have LiftOff!

Project Description:

The students will be learning about rotation and speed while measuring the different RPMs of the Helicopter during hovering, ascending, and descending. It is designed to help demonstrate to students why a helicopter can vertically lift off the ground. It allows them to explore what aerodynamic factors contribute to the helicopter's ability to do so. The project will last over several different days in the classroom. We will begin with learning the different parts and aspects of a helicopter. The demonstration will actually allow the students to measure the speed of rotation, and how it changes during movement of the helicopter. The students will be learning and using a digital tachometer to accurately measure the RPM. They will need to calculate the RPM depending on the different influences on the helicopter. They will use a tape measure to measure the distance the helicopter ascends or descends. They will determine the hover rate, the ascent rate, and descent rate of the helicopter. Each demonstration will be repeated to ensure accuracy. The averages of the different rates will be used to make a graph of the information. The exercise will then be repeated using different weights attached to the helicopter. http://www.sciencebuddies.org/science-fair-projects/project_ideas/Aero_p043.shtml#summary

Enhancements to classroom:

I have been a physics instructor for 17 total years, including 3 years at West Point High School. Previously, I was the instructor at The Institute of Science Highs School for 14 years. This project will allow me to actively involve the students in learning different aspects of aerodynamics and motion. It will give me the necessary means to demonstrate the different variables that can change rate of motion. It is very important for the students to begin to understand the concepts associated with motion. The activity will allow them have direct participation in an interesting manner.

Number of Students and Extent of Involvement:

The class has a total of 15 students. There are 7 female and 8 male students. I anticipate the students completing the experiment with each other entirely. I want the students to measure the different aspects and calculate the correct corresponding rate. The point of this experiment is for the students to have hands-on experience with rates of motion.

New aerospace-related materials:

The remote control helicopter will allow for many future activities for the students to be involved. The Tachometer will give the students the opportunity to learn the mechanics of the machine, as well as the ability to take measurements of rotation.

Arkansas Frameworks:

Physics/Science Curriculum Framework

Grades: 9 - 12

Standard 1: students shall understand one-dimensional motion

Standard 2: students shall understand two-dimensional motion

Standard 3: students shall understand the dynamics of rotation equilibrium

Standard 16: students shall demonstrate an understanding that science is a way of knowing

Standard 17: students shall safely design and conduct a scientific inquire to solve valid problems

Standard 18: students shall demonstrate an understanding of historical trends in physics

Standard 19: students shall use mathematics, science equipment, and technology as tools to communicate and solve physics problems

Detailed Budget Justification:

Materials/Supplies:

Amount:	Description:	Purchase Place:	Price (with tax):
1	Warbird 2 Radio Control Helicopter	Toys R Us	\$100.00
1	Neiko 20713A Digital Tachometer	Amazon	\$30.00
1	Taylor Digital Scale	Walmart	\$15.00
1	Sportline 480 Stopwatch	Walmart	\$15.00
1	9-piece Hanging Weight Set	Sci-Supply.com	\$40.00
		Total:	\$200.00

Match Budget:

Amount:	Description:	Value:
1	Samsung Digital Video Recorder	\$155.00
1	Tape Locking Tape Measurer	\$15.00
16	Safety Goggles	\$30.00
	Total:	\$200.00