Apogee Components

PEAK OF FLIGHT

NEWSLETTER

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Rocketry Success With Disadvantaged Students

Cover Photo: Sky Rocketry's Sky-Eagle rocket kit takes to the air. Get one at:

www.ApogeeRockets.com/sky_eagle.asp

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Rocketry Success With Disadvantaged Students

By Barbara Murphy

I am responding to your article *"How to Overcome Teacher Resistance Using Rocketry in the Classroom"* (www.ApogeeRockets.com/Education/Downloads/Newsletter273.pdf). My scenario is slightly different from a regular content area teacher. I teach the gifted students at my school and have more leeway with my curriculum. Although my school is Title I, Inner City with 89% of the students receiving free lunch, little has stopped us in a successful rocket program.

Let me give you some background information first. Our rocket program began four years ago. At that time, my husband led the rocket team at Stone Middle School in Huntsville, Alabama before it merged last year with Westlawn Middle School. Mike was an aviator, pilot, engineer and had a passion for working with middle school youth in their pursuit of rocket science.

The first team was three teens who spoke little English and my husband, who spoke little Spanish. A lot of it was pointing at instructions. Their first introduction was building a model rocket from a model rocket kit purchased at a craft store to introduce the boys to the basics of rocketry. They also attended a model rocket class offered by the Huntsville Area Rocketry Association (www.hararocketry.org) offering an overview of rocket principles using models built by HARA.

Teamwork is the key to success

Barbara Murphy and one of the TARC rocket teams that made the finals in Virgina.

Vince Huegele, a former HARA president and member of NAR said the language difference is not a problem. "Building a rocket is mostly a visual activity, so I would show the students how all the pieces fit and worked together and they would do what I did."

Mike enlisted the help of three other defense contractor employees, all Spanish speaking engineers to assist with the project. The men not only helped communicate with the students but served as role models, too. "*[The students]* can say to them, 'If he can do it, I can do it.'" Mike said.

The team went on to have a TARC qualifying flight of nine. Their team was one of two from the state of Alabama that received an invitation to the Nationals in 2007.

Since then, the Westlawn team has qualified two more times for Nationals. And this past May, they made it to the top twenty. Quite a feat, since Mike died suddenly in December 2009, but friends stepped in to continue mentoring the team.

How Does This Relate For Other Teachers?

What does all of this have to do with the article you

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About this Newsletter

You can subscribe to receive this e-zine FREE at the Apogee Components web site (www.ApogeeRockets.com), or by sending an e-mail to: ezine@apogeeRockets.com with "SUBSCRIBE" as the subject line of the message.

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Rocketry Success With Students

Loading the TARC egg-lofter on the launch pad.

wrote? I guess I want to say that any teacher can have a rocket team. If you are able to find an engineer to help, the complexity part goes out the window. All you need to do is ask and if being polite doesn't work, be tenacious.

Peer pressure and embarrassment and ridicule from purchasing mistakes happen. Everyone makes mistakes and rocketry is all about overcoming a lot of mistakes.

> ***"In order to succeed you must fail, so that you know what not to do the next time."***
>
> Anthony J. D'Angelo, The College Blue Book.

Apogee Components, and the other vendors we have dealt with have bent over backwards to help selecting the best materials and advice. Again, all one has to do is ask.

Legal fears - For some reason this is one area that never has been a problem. The people that work with my team are all competent, careful and know what they are doing. Plus, the guidelines provided by TARC are explicit.

State standards - I can only speak for Alabama. National Standards are not much different from Alabama's Standards.

NASA has informative lessons and materials online for rocketry to download. These supplementary classroom materials have been developed for use with students in grades 5-8 and 9-12, as well as lifelong learners. They are aligned to the following National Standards:

National Standards (Grades 5-8)

Science	Design and conduct a scientific investigation. Use appropriate tools and techniques to gather, analyze, and interpret data. Develop descriptions, explanations, predictions, and models using evidence. Think critically and logically to make the relationships between evidence and explanations. Demonstrate an understanding of properties and changes of properties in matter. Demonstrate an understanding of motions and forces. Demonstrate an understanding of transfer of energy. Implement a proposed design.
Mathematics	Extend an understanding of the concepts of perimeter, area, volume, angle measure, capacity, and weight and mass.
Technology	Use content-specific tools, software, and simulations (e.g., Web tools) to support learning and research.

National Standards (Grades 9-12)

Science	Design and conduct scientific investigations. Use technology and mathematics to improve investigations and communications. Formulate and revise scientific explanations and models using logic and evidence. Demonstrate an understanding of the structure and properties of matter. Demonstrate an understanding of motions and forces. Demonstrate an understanding of the interactions of energy and matter. Implement a proposed solution.
Technology	Select and apply technology tools for research, information analysis, problem-solving, and decision-making in content learning.

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Everyone wants to take pictures of a TARC rocket.

Publicity

Can I say that we have never had bad publicity? Huntsville is Space City. Anything our schools do relating to rocketry has always had positive review whether on TV, in the local papers or even on the radio. All three media cover the exploits of our team. We are fortunate to have much of our funding come from two organizations. The first is HATS-STEDTRAIN. K-12 teachers have almost no funds for hands-on science projects and hands-on has been shown to provide the best kinds of educational experiences. The HATS-STEDTRAIN Seed Grants make possible what otherwise could not be.

The second source of funding has been the Schools Foundation - whose mission is to identify and support technological advances:

- Support initiatives that promote high expectations for professional leadership
- Ensure an engaged and involved community in order to create a strong sense of belonging, caring, involvement, and support
- Support cross-district collaboration
- Seek financial support for educational needs

Building sessions draw the team together

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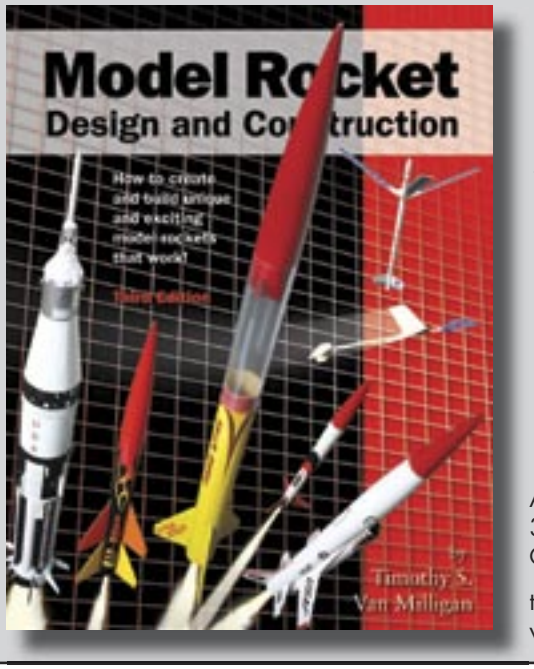

Model Rocket Design and Construction

By Timothy S. Van Milligan

New 3rd Edition Now Shipping!

This new 328 page guidebook for serious rocket designers contains the most up-to-date information on creating unique and exciting models that really work. With 566 illustrations and 175 photos, it is the ultimate resource if you want to make rockets that will push the edge of the performance envelope. Because of the number of pictures, it is also a great gift to give to beginners to start them on their rocketry future.

For more information, and to order this hefty book, visit the Apogee web site at: www.ApogeeRockets.com/design_book.asp

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Rocketry Success With Students

Good publicity for us is good publicity for them.

Recent Happenings

After my husband passed away, two friends, Steve O'Dell and Lee Huntington took over. One is an engineer, the other a physicist. Can I say I was lucky or blessed? These two men gave much of their personal time to help the team. One of the team members, Anthony Nelson said, "I gained so much knowledge. I didn't know anything about rockets before, other than they went into the air. We are dedicating this year to be the best and I'll be thinking about him (Mike Murphy) when we set it off."

Barbara Murphy enlisted the help of engineers and parents like Spencer Myrick to help guide the TARC team.

Something worked and the team made it to the top 20 in the nation.

2010-2011's team is going strong. They are determined to do better than last year and are thinking of the first place awards. We have Lee Huntington to serve as a mentor again and a parent, Spencer Myrick. Working with teens is a unique experience, each one going in many directions. Spencer suggested trying something different by building a team/family unit. We meet monthly for activities such as ice skating, bowling, camping and dinner. This provides more team spirit and is something they look forward to as well as have fun. Joe Paterno, a former football coach said, *"When a team outgrows individual performance and learns team confidence, excellence becomes a reality."* That has been the case for our team.

In conclusion, I want to say that any teacher can have a rocket team. It only takes determination, tenacity and time. The results can be profound, as my students come from an inner city background. Already the three in high school have their sights set on college and beyond. Anything is possible!

Reader Question Answered

What Kind Of Shock Cord Mount For Minimum Diameter Rockets?

David Foster asks: *"I noticed you said that a blob of epoxy clay works good for a shock cord mount. If a modeler is using kevlar string on a relatively small rocket - 13mm to 29 mm, would you recommend the epoxy clay method or the old estes method of folding paper with wood glue?"*

My first response to this question is to ask for more information, such as: what is the purpose of the model? Is it competition, or just a sport model? How big is the recovery device inside the rocket? Is it a minimum diameter model, or does it have a smaller engine mount in it?

The reason for the extra questions is that the purpose of the rocket would dictate what kind of mount that I would use.

With an engine mount, or even just an engine block, you can tie the shock cord down to the ring near the engine. It works fine, but you do have to make sure to have a lot of glue on the ring to hold it in place. For a minimum diameter rocket this can be a good option.

The problem with both the Estes style and the epoxy clay mount is just getting it into a small diameter tube. You have to be deep enough to be past the nose cone's shoulder. It can be hard for people with fat fingers (like me).

The Estes style has another disadvantage in that there can be a lip on the paper, which can snag the parachute as it comes out of the tube. That's why I asked how big the recovery device was. The bigger the recovery device in a small tube, the more it can get snagged at ejection.

The problem with the epoxy-clay mount is just getting it into the tube and leaving it alone until it has enough time to cure. I often get impatient and tug on the shock cord to see if it has hardened. If it hasn't, you'll rip it right out of the epoxy, and then you have to start over. But if you can resist the temptation, then you can get a fairly smooth mount that will allow the chute to slide easily out of the tube.

In Peak-of-Flight Newsletter 231 (www.ApogeeRockets.com/Education/Downloads/Newsletter231.pdf), there is a plan for a removable shock cord anchor that might be a good alternative too. It does require an engine block in the model though.

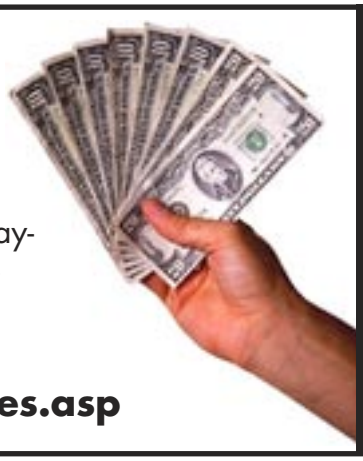
Another way to attach is to feed the shock cord through a hole next to the fin (see attached photo). You then lay the end of the shock cord along the fin root, and cover it up with a fillet of glue or epoxy. This also works well when you want to keep the inside of the tube clear so that there is nothing for the chute to hang up on at ejection.

I use this method on competition models to keep the weight down, because it doesn't require an engine block at all. But as you can tell, you have a lot of good options.

External shock cord mount. It can be covered by the fin fillet to reduce the aerodynamic drag.

We're Paying Cash

For Great Articles for This Newsletter



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