



# PEAK OF FLIGHT

N E W S L E T T E R



## In This Issue

### ***How To Overcome Teacher Resistance To Using Rockets In Classrooms***



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## How To Overcome Teacher Resistance To Using Rocketry in Classrooms

By Tim Van Milligan

Rocketry is so full of educational value, that I view it as the “PERFECT” tool to reach students and infuse knowledge and practical concepts into their minds. Nothing else has the power to excite kids to learn like a rocket does. The benefits are so profound, that I have a hard time understanding why every teacher doesn’t use rocketry in their classrooms. I’m preaching to the choir here... you already know this.

But I often get emails from people like you asking me what they can do to get their kid’s teacher to use rocketry. As a parent, you know the cool benefits that rocketry offers, and you want your child’s teacher to give it a try. What could be better than have your child even more excited about rocketry than they already are?

### Getting Teachers To Try Rocketry

Teachers won’t see all the benefits to rocketry unless they try it that first time. That is the real problem that we face. Once they try it, they’ll be hooked. It worked on you when you saw your first rocketry flight, didn’t it?

But to get them to try it that first time, they need two things. To conquer their fears that they may have about rocketry, and to understand how rocketry has exceptional educational value.

You, and people like you, that offer to assist a teacher in the classroom, are the answer to both needs. You are the solution! You’re that important.

### What Are The Teacher’s Fears?

Teachers are just like everyone else. They have fears. And when it comes to rocketry, they get really anxious. What types of things are they afraid of? And more importantly, what can you do to calm those apprehensions? That is what the rest of this article is about. I’ll give you the six big fears that I see teachers having.

### Fear 1: The Complexity of Rocketry

It is “Rocket Science” after all. We joke about this amongst ourselves about how smart we are; after all, we

wear with pride the t-shirts that say “*As a matter of fact, I AM a rocket scientist.*” But think about the inferiority feelings that others may be about the complex mathematics and physics that underlies rocketry.

Not only is there complex science involved, but there are the construction aspects as well. Most people that begin rocketry for the first time are worried that they are going to build the rocket wrong, and/or that it will come apart or go screwy at lift-off. They didn’t learned the necessary craftsmanship skills to put together a model of any type, let alone one that can reach several hundred miles-per-hour when you shove a rocket engine into its rear end. If you think about it, the process can be extremely daunting to a lot of people.

It isn’t just teachers that are apprehensive about building rockets. It is pretty much everyone that starts rocketry for the first time. I have learned to expect this, which is the reason why I put so much time into creating videos that show how to assemble rockets. I have them for beginners ([www.ApogeeRockets.com/getting\\_started.asp](http://www.ApogeeRockets.com/getting_started.asp)), and for people that want to improve on what they already know ([www.apogeerockets.com/Rocketry\\_Video\\_tips.asp](http://www.apogeerockets.com/Rocketry_Video_tips.asp)).

You have to quiet these fears that rocketry is complex. Your very offer to assist them is *HUGELY* important in this regard. When you offer to help, they think to themselves that they finally have a shoulder to lean on and explain to them the things that they may not know. It is very calming.

Another thing you can do is to use a story of how a teacher, just like them, used rocketry and how successful it was. I’m sure you can think of a teacher you knew from your past experiences that used rocketry. They are your example. You can tell them how the teacher thought that rocketry would hard, but once they tried it, they became the hero to their students. The students had problems with attentiveness and attention to detail before they started, but once the rockets were brought into the room, there was a marked change in the atmosphere.

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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](http://www.ApogeeRockets.com)), or by sending an e-mail to: [ezine@apogeeRockets.com](mailto:ezine@apogeeRockets.com) with “SUBSCRIBE” as the subject line of the message.

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## How To Get Teachers To Use Rockets

And after telling of the other teacher, mention that you will be with them in the room to take all the hard questions that their students might ask. That will greatly reduce their stress to a manageable level.

### **Fear 2: Jeer Pressure**

This is a fear that they'll be looked down upon by their fellow teachers.

It is an unspoken fear that no teacher will admit to, but I see it in every school I work with. *"Anything this fun can't be good for you, right? And when has education ever been fun?"* Those thoughts are actually planted by jealous teachers that are peers to your student's teacher. These other peers feel inferior because their own students aren't as happy and energized as the ones from the class that is flying rockets. So these peers may make snide comments about them goofing off – *which is obvious from the fact that their kids are having so much fun.* That makes life harder on the rocketry-teacher, because it creates a tense working environment. Most times it is easier to go with the flow and not make waves in the workplace. Even in schools there is office politics. Go figure...

I believe that this is a big reason why most teachers only do rocketry as an end-of-the-school-year-activity. They can get away with it at the end, because they see a lot of their fellow teachers also winding down for the term.

But when you come in to the school as an assistant {by the way, always portray yourself as an assistant, and not as an expert}, they gain credibility amongst their peers. They gain confidence, because YOU are coming into the school. In other words, they now have a crowd of their own to face down the other teachers. They find safety in numbers, and you, and any other parents that you can get to help, will allow them to rationalize away the comments made by other

teachers.

### **Fear 3: Embarrassment and Ridicule From Making Purchasing Mistakes**

This one goes hand-in-hand with fear number one. Because rocketry can seem complex, they fear they will be ridiculed by others for buying the wrong items for their rocketry project.

No one likes to be taken advantage of. That goes without saying. But it isn't so much the money that was wasted, as the ridicule they'll receive from others. How would you like to be called stupid for buying something that you didn't need? You'd feel that your boss (the school principal) wouldn't trust you to wisely spend money in the future.

This fear of embarrassment is one of the most powerful motivators that prevent people from acting in their best interest. You don't believe me? Let me give you an example. Say you were in a packed auditorium, such as a church, and someone offered you \$100 to go up on stage and sing the National Anthem in front of the audience. Most people won't take the money, because the fear of embarrassment is a greater motivator than the reward of \$100.

You have to assume this fear is present, even though they will never tell you about it. Just nip it at the beginning of your sales presentation.

Here again, you can help. When you offer your assistance, you can say something like: *"Let's get together to inventory the equipment you already have. I bet you have most of the stuff you need, and you won't have to get too much more. In any event, I can help you make sure you have all the right equipment in place in order to make this is a successful project for your classroom."*

Choose your words carefully. Notice that I didn't say the word "buy".

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## How To Get Teachers To Use Rockets

The point is, you're lowering the fear that the teacher may have about having to buy something they are not familiar with. That reduces the chances of them having to deal with an embarrassing situation. With your help, they'll get all the right stuff and at the same time they'll minimize any purchases they might have to make. They'll feel like a hero, because they can then go to their boss and tell them how much money they've saved.

If you need any help with this, please feel free to call us here at Apogee. You already know our reputation for making sure people don't buy what they don't need. You can feel confident that we will take good care of you and the teacher you're working with.

### Fear 4: Legal Fears

Let's face it, we live in a litigious society. Everyone is afraid that someone will sue them for something. Teachers are constantly sending home permission slips for parents to sign, because of this fear. You can't make this go away completely, but I can give you some ideas on how to greatly reduce this fear. How do you do it? By coming in to the teacher prepared with scientific data.

I'm sure you remember the movie, *October Skies*, in which our hero, Homer Hickham is accused of starting a forest fire. He proves his innocence with cold, hard, scientific facts. He uses the laws of physics to prove that it wasn't his rocket that started the fire, and he actually gets a good estimate of where the rocket should have landed, and finds

it in the part of the forest that wasn't burned in the fire.

You can do the same thing with the teacher. You can come into the classroom with your RockSim plots, and other data showing how the risks can be minimized. More on this in a future article.

### Fear 5: Not Teaching Educational Standards

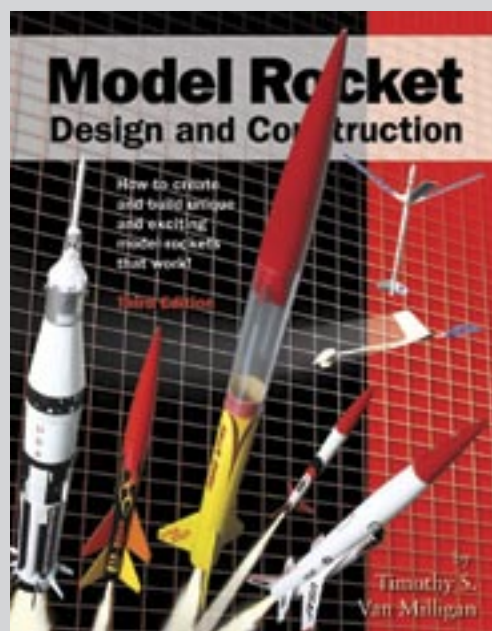
Teachers fear that they aren't using the time to teach the mandatory things. I constantly hear teachers complain about having to teach toward the "standardized tests" that the students are required to take. You almost get sick of hearing them moan about how all the creativity has been taken out of their classroom; they can't teach rocketry, because they don't know how it fits into the state's academic requirements.

Here is what I do when I hear this type of argument. I ask the teacher: *"What kinds of things are you teaching right now? I might be able to come up with a way for you to incorporate those topics into a lesson that uses rocketry."*

To be honest, I'd much rather they be teaching something useful for the students than just putting on a fireworks display at the end of the school year. After all, launching a rocket has no value to NASA. For them, it isn't a success until the rocket is launched and the data starts coming in.

That's how I like to approach it with teachers. I say to them that we're going to launch the rocket and get back a lot of data, just like NASA. *"What kind of data do you want*

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## Model Rocket Design and Construction

By Timothy S. Van Milligan

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**Apogee**  
COMPONENTS

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## How To Get Teachers To Use Rockets

*the students to have, and what comparisons do you want the students to make with it?"*

When you say this, just be ready to offer ideas on how to use rocketry to teach the concepts that they are all ready studying. Refer to the article on how rocketry relates to the world and school subjects ([www.ApogeeRockets.com/education/educational\\_projects.asp](http://www.ApogeeRockets.com/education/educational_projects.asp)). It will give you a good starting point, and I'm sure you can come up with your own. You're the solution, but you have to be prepared.

In addition, I'll give you another tip that will convince the teacher to fly rockets as part of the curriculum. Say something to the effect of: *"I'll help you come up with a plan."* What they hear is: *"I'll do the work for you."* That is a magic phrase that melts any resistance they might have to using rockets in their classroom. If you're doing the work, that means they will be able to take a breather and get some other stuff done.

### Fear 6: Bad Publicity

Teachers are not the only ones that are to feel the affects of peer pressure. The school's administrators do too. Principals and superintendents fear the big headline in the local newspaper that goes something like: "Local student launches rocket that breaks a window." This is why so many teachers, who would otherwise launch rockets, are not given permission. So the problem is really how to quell the fear of bad publicity?

The answer to this of course, is "GOOD publicity."

You're going to create a PR campaign that is going to generate good publicity for the school. The target audience that needs to see this publicity is actually very small. That means it is easy for you to accomplish the PR campaign without a lot of work. The only people that need to see it are the teacher, the principal, and maybe the school board or administrator that the principal works for.

The concept of the PR campaign is to link "rocketry," "students," and "a good outcome" together in a newspaper article. You're going to show them that rocketry leads to good things. Not only good things, but good things about "their school." The purpose is to get them to make the connection that they're doing a good job. Not only do they feel that they are a good educator, it calms the fears that a school administrator might have that rocketry can only lead to bad things.

It is important to link their school into the publicity, because that stokes their egos. Can you every go wrong by using flattery? That's why it works. This is such a powerful technique and works so well, that it almost has to be illegal...

That is the overall strategy. So how do you implement it in your situation?

First, you have to look for some story that you can tell that includes these three things: *rocketry, students, and a good outcome for the school.* I can almost guarantee that you won't find a perfect story, so YOU have to create

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## How To Get Teachers To Use Rockets

it in the newspaper. In other words, your story is going to be manufactured. That doesn't mean it is untrue; but that you're going to tell the story so that the school is the real hero.

Here's the story I planted in the newspaper, and I'm sure it will strike an idea that you can use for your school. My daughter took third place at NARAM this summer. She could have finished dead last, and the story would have still worked. It is a ho-hum story, but here is how I spun it:

- *Girl goes to a NATIONAL rocketry event.*
- *Girl puts in a massive amount of preparation time in order to compete.*
- *The time Girl puts in to rocketry meant that she had to give up playing with her friends (obstacles).*
- *Girl aspires to go to the competition again next year. Girl hopes to compete in TARC competition, which just so happens, is sponsored by NASA (this gives legitimacy to rocketry).*
- *Finally, and this is the important part: Girl goes to the local school (named), and girl attributes good grades to her interest in rocketry."*

So I wrote up the story, and submitted it to the "community blog" on the web site of the local newspaper. Every newspaper now has a web page, and they allow people to submit these kinds of things. Just go to the web site of your local newspaper and look for the page that allows readers to submit a blog or submit a story idea. They all have them, which makes it easy for you to get the article in front of the eyes of a newspaper editor.

If you write the story in a newspaper format, like it would be written by a paid reporter (that means without any "hype"), then there is a 95% chance that they'll take the article and run it in the print edition of the paper. I say this,



**The editor of the newspaper did me a HUGE favor by putting the school name in the sub-headline.**

because most newspapers LOVE to have stories about kids doing something good.

{For more tips on writing press releases, see Peak-of-Flight Newsletter #19, which you can download at: [www.apogeerockets.com/education/newsletter\\_archive.asp](http://www.apogeerockets.com/education/newsletter_archive.asp)}

Look at this situation from the perspective of a newspaper editor. They live there too, and it makes them feel good about the town that they live in to have a "positive news" story for a change. After all, what does it do to their house's property value when all the articles in the local newspaper are about bad kids that get into trouble? They reprint stories like this because they want to feel pride about their town. You're playing to their self-interests, which is why it is so easy to get these kinds of news articles in the paper.

But remember what I said earlier. There are only a few people that need to see the article: the school teacher, the principal, and the other administrators that the principal answers to. So make sure you have your kid take a copy of

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new friends from different parts of the country." She also likes telling other kids her age, "Rocketry is fun and that it helps me do well in school."

In addition to taking third place, the fifth-grader also set two new national

*Linking good grades to using model rockets... the administrators eat this stuff up like candy.*

the newspaper to school with them, just in case the teacher hasn't seen it on their own. And even if it doesn't make the print edition, the article will be on their web site in the blog or comments section. You can get the URL address of that page and send it to the teacher and the principal. It works just as well for our purpose of persuading them to use rockets in their school.

What happened next, in my real-life example, was predictable; the teacher took the newspaper to the principal, and the principal took the newspaper to the administration.

Pretty soon, we had people collecting papers to give to us, because they thought we wanted to have copies for our scrap-book.

The principal was so excited by the article, that they put a mention of it on the school's web site and in the monthly newsletter that they sent home to all the children.

The point is that the article made the principal feel good about a kid that was getting good grades at their school ("good" is subjective...).

This technique worked like a charm, and it can work for you too. A few weeks later, my daughter comes home from school and says: "daddy, my teacher wants to fly rockets in class, and wants to know if you can help." Is that a happy ending, or what?

There is actually more to this story, because I'm setting it up for even more good publicity for the school. Which means I want them to fly rockets next year too.

The next newspaper story will go something like this:

*"Girl loves rockets and wants to share that passion with others, that she used her own money to buy rocketry supplies for her school. Repeat elements from previous story: Girl hopes to compete in TARC competition that happens to be sponsored by NASA. And Girl goes to the local school (named), and attributes good grades to her interest in rocketry."*

The newspaper will print it, and the principal and the

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## How To Get Teachers To Use Rockets

teacher are going to look great and smart. They should be, because after all, they conquered their fears and were smart enough to fly rockets in school.

### One Last Fear You Can Calm

When working with teachers and administrators, you can use one final strategy that is going to melt resistance they might have to your request to use rocketry in the school. This is a big concern they all have, that when your massage it, it will turn them into putty in your hands. I hesitate to mention this one, because it sounds like manipulation. But when you are getting someone to do something that is good for them, you are actually helping them in the long run.

The one concern that all teachers have is that they want to feel that their work with students is making a difference in the world. One day, they will retire from teaching, and they'll look back and reflect on their life and what they accomplished. The thought that is going on is "Did I inspire any of my students to do great things?" After all, the teacher, by the nature of their profession, attaches meaning to their life by the actions of their students. For example, the teacher will never find the cure for cancer, but maybe one of their students will. They will NEVER walk on the surface of Mars, but what if?... What if one of their students does?

Do you see where I'm going here?

The teacher, the principal, and the administrator all want to know that they *"touched the future, and made it better."* But they really don't know how they are putting their fingerprints on the future; at least not until about 20 to 30 years have passed and they can look back and reflect on what their students did with their lives.

You can paint this picture for them right now. You can tell them how rocketry shapes the future in a positive way. I

do this all the time! And it works. Their resistance vaporizes like a puff of dust blowing in the wind.

Here's how you can say it to them. *"You know, Mrs. Smith (whatever the name might be), I know you'll look back on this and reflect on what a good decision it was for you to fly rockets in your class. I know you'll touch a life in a way you cannot even imagine. Kids that fly rockets seem destined to do great things in their lives. Can you imagine one of your students walking on the surface of Mars? I can envy the pride that you'll get to feel on that day. What do you say? Can we schedule a day for me to come in and assist you with the rocket construction?"*

Does that wording work on your heart-strings? I know it works on me. That is why I continue to sell rockets here at Apogee Components. I want to touch the future too.

I don't consider this manipulation, because I see things from having a long-term relationship with modelers. I've been selling rockets since I first worked for Estes Industries in 1991. That's 20 years. So I've seen what my customers have done. I know the power that rocketry has on students' lives, and how they go on to awesome careers. That is why I love the TARC program of the NAR. I only see good things happening in the future because of the benefits of flying rockets.

So if I were smart, the next PR campaign that I do should include some wording to the affect of: *"Girl hopes to be the first astronaut to step on the surface of the planet Mars."*

## Conclusion

I know a lot of modelers, like you, who work with schools and assist teachers during the building and the flying of rockets. That is so awesome, and I'm so appreciative of those willing and able that do this, that I can't even begin

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## How To Get Teachers To Use Rockets

to express my admiration and gratitude. It is paying forward to the next generation far more than you can imagine. What you are doing today to help out in schools is coming back around in 20 years when those students start their own families. Your work in rocketry really does matter! Never forget that. You matter to them, and you matter to me.

It is my hope that this article has given you some ideas on how to get more teachers to use rockets in their classroom. If you have other ideas that I haven't thought of, please share them with me. I'd be honored to pass them along to other modelers and give you the credit.

## If You Are A Teacher

If you are a teacher, and you are interested in using rockets in your classroom, I have some good news for you. There are modelers in your area that are willing to come and assist you in the educational activity. I know they exist, because they are writing to me asking me how they can get their local teachers to use rocketry in the classroom.

So how do you find them? I recommend you go to the NAR's web site ([www.NAR.org](http://www.NAR.org)), and look for the nearest local rocketry club to your city. Contact the club by visiting their web site and sending them an email. I know they will be jumping at the opportunity to help you out. You are not alone, as there are people willing to help!

Finally, if you are a teacher and you have used rockets in the past, I'd love to hear from you too. I need stories

from teachers that I can pass along. I need stories of how successful rocketry has been in your classroom, and how it has touched lives of your students. I'll be happy to pass these along to other teachers in order to convince them to give rocketry a try in their class too. Your stories could be the spark that ignites the passion of a student in another part of the country. That makes you just as important as the teacher willing to give rocketry a try that first time.

## About The Author:

Tim Van Milligan (a.k.a. "Mr. Rocket") is a real rocket scientist who likes helping out other rocketeers. Before he started writing articles and books about rocketry, he worked on the Delta II rocket that launched satellites into orbit. He has a B.S. in Aeronautical Engineering from Embry-Riddle Aeronautical University in Daytona Beach, Florida, and has worked toward a M.S. in Space Technology from the Florida Institute of Technology in Melbourne, Florida. Currently, he is the owner of Apogee Components (<http://www.apogeerockets.com>) and the curator of the rocketry education web site: <http://www.apogeerockets.com/education/>. He is also the author of the books: "Model Rocket Design and Construction," "69 Simple Science Fair Projects with Model Rockets: Aeronautics" and publisher of a FREE e-zine newsletter about model rockets. You can subscribe to the e-zine at the Apogee Components web site or by sending an e-mail to: [ezine@apogeerockets.com](mailto:ezine@apogeerockets.com) with "SUBSCRIBE" as the subject line of the message.

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