

Professor Pi Blog: Set the Stage for Success

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Ten80 Education & The FastTrack Racing Challenges

Having things fail when you don't know why is frustrating. Having things fail in a calculated pursuit of excellence is inspiring; it drives you to work even harder.

It's natural. We want to drive the RC cars as fast as possible as soon as possible! Performance Now!

The problem is, there are about 14 million different ways to set up your FastTrack RC car and a very small fraction of them will give high performance in a race. If your plan to find the best possibilities is trial and error, you're likely to meet with frustration rather than the checkered flag. You're playing the technology lottery and the odds against you are 14 million to 1.

Changing things on the car just because they can be changed usually gets you nowhere...and gets you there over and over and over.

In FastTrack RC we want everyone to be as innovative as he or she can be. Think outlandishly. Think outside the box, outside the sphere and the pyramid too. The real thrill of science, engineering and technology is to tackle something that seems "impossible"; whether it is the ability to fly, orbit the earth, talk to someone 15,000 miles away or decrease your lap time by 1/10th of a second.

Pushing the envelope of what's possible means there are lots of failures. Every good engineer has a closet full of stories about building things that crashed, blew up or caught fire (even better if it happens all at once); however, why things fail matters a lot. There is a huge difference in seeing all the wheels fall off your RC car because you:

- A. Simply drilled a bunch of holes in it to lighten the load, or
- B. Went just 8% too far in your plan to improve the ratio of sprung to un-sprung weight

The former makes you want to give up; the latter sends you back to calculating because you know what happened, you know what to do next and you know your car will outperform the others (and maybe you'll get another spectacular wreck in the bargain)!

To make the seemingly impossible happen, we need to encourage one another to ask questions and investigate to find answers; to design for improvement. We need to create a culture that celebrates incremental progress (baby steps forward); a culture of finding the best possibilities through trial-and-model. Trial-and-model doesn't mean you avoid errors. It means your results aren't considered errors because you're building something through them: a model of your car's performance. You're finding answers to the endless array of questions instead of just more questions.

So how do you go from seat-of-the-pants playing to leading the pack? Start simple. Start by learning the basics of performance (See the Quick Start Guide and the Pit Crew Manual) that matter most. Measure and model speed, acceleration, down-force and drag with various gear ratios and car bodies. Once you understand those things that impact performance the most, investigate more subtle input like suspension and roll center settings (c-rings in the springs, suspension points and toe settings). You'll improve greatly in the beginning then continually squeeze out improved performance.

Start simple and start now. Build a dynamic team of innovators, dreamers, rigorous thinkers and achievers. Start channeling your innovation; I think you'll be amazed at what you can achieve in just six months.