

### BEFORE

For eight months, I spent countless hours with eleven other members in our school's do-it-yourself club putting together the pieces of a complicated puzzle. Although we placed third in our class in our first race, I never will forget the thrill of using my ingenuity to solve problem after problem successfully.

Two days before the race, we mapped the school's parking lot to simulate Lyme Rock's track and figured out the number of laps necessary to match the race's distance. With stop watch set at zero, we cheered the second the car kicked into gear. Minutes later, just as the car swerved through a sharp left U-turn, joy turned to instant panic when front left tire's hub flew straight through the cheap plastic spokes supplied with the original kit. Forced to lift and lug our 300-pound disappointment back to the school's workshop, no one said a word. With long gas When we walked out to test the car we all had a jump in our step in excitement, and when we were forced to carry the car in early nothing was said and our blank faces stared at the ground. We started to brainstorm where we could get a new pair of tires for the front of the car.

Calls were sent out to our parents to bring in old bikes or mopeds to see if we could make anything work. The group made a decision to modify a pair of old and slightly rusted moped tires. At the time we had no idea how big of a commitment that would be. This new project to get our car rolling again took virtually the whole night. It was amazing how the team stuck together. No one left until we had the tires on despite the lengthy process of adjusting the bearings in the tire to the right size. We had to use tin foil to get the right spacing, it wasn't pretty but it worked. I thought that it would all be worth it when our car is out there on the track.

Then, during the race, our throttle broke. At first we didn't know what was wrong. We checked the batteries first, then all the wiring and sure enough we found out that our throttle had malfunctioned. I ran over to grab our spare throttle and a pair of needle nose pliers, and the duct tape to attach it. Then as me and one other member pushed the car back on the track and watched it accelerate I thought that any chance of placing was gone. Then to my surprise we managed to place third in our class. For our high school's first time in the Connecticut Electorthon we all were proud of our selves for even finishing the race let alone winning a trophy after all we had been though in the past few days.

### AFTER

"Now, what's wrong?" Jack cried in exasperation.

"The sprocket on the drive shaft detached, and every screw is scattered somewhere on the track." As the designated leader of the pit crew, I immediately rolled the car onto the sidelines and got to work. "Hand me that box!" I yelled. After trying what seemed like a thousand screws, I knew we had lost our edge. "Okay, so none of the screws fit. What if I change the size of the hole?"

Where's the drill?" I screamed again.

"If you do it wrong, you could ruin the motor for good," Brad warned.

"I would rather do it than just give up." Somehow, I thought of drilling new holes big enough for the nails I had jammed into the shaft to reattach the sprocket. With the car back out in less than ten minutes, surprisingly, once again we placed third in the competition.

For the previous eight months, the eleven members of our school's do-it-yourself club had spent countless hours putting together the pieces of a complicated puzzle. We met every week to work on our chosen project: an electric racecar. Although we placed third in our class twice, I never will forget the thrill of using my ingenuity to solve problem after problem.

Plagued with crisis almost from the start, we kept going. Two days before our first Lime Rock race, we mapped the school's parking lot to simulate the official track. With our stop watch set at zero, we wanted to know how many laps the car could complete in one hour. Cheering wildly the second the car kicked into gear, we groaned as our joy soon turned to instant panic. Just as the car took a sharp left U-turn, the front left tire's hub flew straight through the cheap plastic spokes supplied with the original kit. As we lugged our 300-pound clunker back to the workshop, no one said a word.

Working though the night, we solved the problem by modifying, then mounting, a pair of old, slightly rusted moped tires a parent contributed. I used some aluminum foil to get the right

The club then planned on entering our second race in the beginning of this school year. We did not have a lot of time to fix everything that we would like to so we made a list of priorities. Our main goal was to put a new rear tire on the back to add some stability to the car. The new tire's wide hub forced us to widen the back of the frame. So we headed the metal and bent it into position. However this brought up a new challenge, we needed a longer rear axel.

Because the race was starting the Tuesday of the next week me and two other members brought it home with us and committed our entire weekend to making the new rear wheel to work. Then late that Sunday night we finally found a way to secure short axel with the perfect amount of washers and cotter pins. I turned on my Jeep Wrangler to use the head lights to provide a little light so we could test drive it a little up and down the street. Then during the race something went wrong again. As the car took a turn I saw it stop and pull of to the side. I ran out to the car to fix whatever mechanical problem occurred but when I got there I saw that it was more than I could do by myself. The Sprocket that is directly attached to the motor had fallen off of the drive shaft. I couldn't believe it as we brought the car in to fix. We decided to drill a hole though the sprocket and drive shaft and jam a nail into the hole to keep it in place. We eventually got the car back out and managed to place third yet again.

When I look back on all the problems the car arose I realize how easy it would have been to give up and accept that we can't race the car. The constant frustration and disappointment that nothing seemed to work the way it should. It seems like every time we take it out something breaks. However despite everything that has gone wrong I still find myself fully committed to solving every problem that the car can throw at our team. I found my passion working on this car. I realized how much I love to work on mechanical problems and work with a team towards fixing them and at the same time improving it so that the same thing will not break twice.

spacing in between the bearings. It wasn't pretty, but it worked.

At the race park at last, assured we had a shot at winning, we watched our baby pass car after car until, gradually, it slowed to a dead stop. "Oh, no! Not again!" I moaned. At first, we couldn't figure out what happened. We checked the batteries and all of the wiring. No luck. Finally, we determined the throttle had malfunctioned. I grabbed our spare, a pair of needle-nose pliers, and duct tape. Soon, I literally had the car back on track. Positive we had no chance of placing, to my absolute amazement, we placed third.

Today, when I look back at the seemingly endless frustrations, I find it hard to believe we persevered. Most surprising of all, however, I discovered how much I enjoy solving mechanical problems. In keeping us on track, I found my direction: a future career in engineering.