NATIONAL RACE FOR INTERNATIONAL SOLUTIONS

All Saints’ Solar Car Team Leads the Way
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Amidst a prominent Classical curricular foundation at All Saints’, a STEM (Science, Technology, Engineering and Math) project is building its niche on campus and on the national track. Through the Solar Car Competition, All Saints’ students have spent their year (and summer) designing, building and racing their own solar-powered vehicle.

Only 23 schools nationwide compete in the Solar Car Challenge. All Saints’ is one of five Dallas/Fort Worth schools and the only independent school. But our students are no strangers to challenge, to innovation.
The Solar Car program is not unique in that it challenges students to think critically. It's not unique in that it brings engineering skills to the high school level. This program is unique because it does each of those things and is a volunteer project that is student-led, student-driven and student-owned, from start to finish.

Not only do the students engineer the design for the Solar Car, but they also build it from top to bottom dedicating five hours a week during the school year and between 10-50 hours a week in the summer. Students learn basic machinery and apply physics principles to manipulate real-life objects; they learn about welding, solar power and electricity. And then they apply their knowledge to achieve the preferred outcome. Success in life is not determined by knowing a solution, but rather by taking part in making the positive solution a reality.

As they are building their car, students are also charged with soliciting sponsorships to cover the costs of building and racing. Faculty leaders Dr. Lyle Crossley and Joe Morris spend time working with the students to develop their poise, speaking skills and knowledge of the overall project…and then they release the reigns and let the students take the driver’s seat.

"It’s surprising, but I get just as much satisfaction from getting a sponsorship as I did crossing the finish line last summer in L.A.,” Nicholas Iglesias ’15 said. “We spend a lot of time preparing for these sponsorship pitches and when we walk into a room full of prominent business men and women, it’s intimidating. But there’s a rush we get when we hear the company decides to hand a check over to help a bunch of teenagers.”

Presentation skills also translate to the competition. At the start of the competition, but before the actual racing begins, judges ask each participating student a variety of questions about their car and about solar energy. The questions are directed at the students, not the faculty leaders. You remember how your mom helped you do your fourth grade science fair project? This is the opposite. The students have to know this project and their roles inside and out. They have to know their car inside and out.

BEHIND EVERY IGNITION IS SOMEONE TURNING THE KEY

The Solar Car program is student-led, but so was the project’s inception. Ryan Drobnich ’15 and Nicholas Iglesias ’15 originally talked to Peggy Wilson, Middle School Physical Science teacher, about the program when they were in the 8th grade. Drobnich had seen a story about that year’s race on the news and wondered if All Saints’ would ever consider starting a Solar Car project. As the boys moved into Upper School, Drobnich’s father, Joe, approached Upper School Division Head Fr. David Madison with the idea. Interested in the opportunity but needing an in-house expert, Fr. Madison went straight to Lyle Crossley who agreed to oversee the project…and promptly called Joe Morris to lead it with him. Thus the project team started to take shape.
The two faculty advisors do more than just show up for meetings. Dr. Lyle Crossley, Upper School Physics teacher, and Joe Morris, Middle School Life Science teacher, organize the workspace and work schedule. They source obscure parts and drive all over DFW to purchase them. They coach students for and attend the sponsorship presentations. They attend workshops and other events to promote the project. They have even served as competition judges in years previous to All Saints’ participating. And perhaps most importantly, they serve as a deep resource for these students.

“One thing that was instilled in me was the belief that with enough research and help from people with training and a passion for engineering, a person could build just about anything,” Crossley said.

When asked what their role as leaders means, Joe Morris said: “Oddly, it is not to build a Solar Car. Our primary role is to help and guide students. We help them learn to plan. We help them learn to research and arrange for purchases. We help them with the scientific process of testing and redesigning and testing again. We help them address the public and teach others about solar power and renewable energy. We help and guide them through working relationship issues. Most of us didn’t learn how to work with others at this level until we were out of college and falling on our face in our first job.”

Both Crossley and Morris share similar backgrounds that uniquely prepared them for this type of project. Crossley grew up with a father who was always inventing and building, including things like trains for amusement parks, small yachts, and a gasoline powered three-wheeled vehicle. He also spent three years at Texas A&M in the Physics Enhancement Project, where he learned how to use engineering-type projects to enhance student learning. Also influenced by his father, an Agronomist and accomplished carpenter, Morris spent his childhood exploring the “whys and hows” of life. That curiosity led him to a career in science (teaching Life Science, Earth Science, Integrated Physics and Chemistry, Biology, General Chemistry, Pre-AP Chemistry and AP Chemistry) and a desire to share his passion for science with students.

“There is nothing more rewarding than stirring up curiosity in young minds and then guiding them to discover the ‘why and how,’” Morris said. Crossley and Morris together, though they arrived with similar experiences, bring different qualities and skill sets to the project and to the mentorship of these students. Crossley focuses on the big picture planning and on goals and deadlines, while Morris focuses on managing the day-to-day tasks and student time. There’s no doubt they are a dynamic duo making their fathers proud.
As Morris indicated, the team is structured much like that of a company, teaching students how to manage working relationships. Members are identified for their strengths and then given responsibilities and tasks that help them develop those strengths and interests even further, whether it’s pairing a computer science person with the solar car’s telemetry system or putting someone who builds cars in free time in charge of the overall build. Students find their niche and current skill sets are utilized while new strengths are developed. Since it’s a small team, everyone is expected to be well versed on the overall car and to jump in when needed. The convenient location of the Solar Car garage also contributed to successful teamwork. Graciously donated by Greg and Brad Fricks, students could gather quickly just off campus at the Fricks Company site and get to work.

The All Saints’ Solar Car Team of 19 Upper School students competed in the 2013 Solar Car Challenge cross-country race from the Texas Motor Speedway to Los Angeles, California, placing sixth in their division. As a first-year participating team, the outcome is impressive. “Last year’s trip from Fort Worth to California was as much a test of our ability to simply build a car that would move under its own power as it was an actual race,” Morris said. “The fact that our car continued to run the entire distance without breaking down, and roll into the California Science Center parking lot under its own power, was an accomplishment none of us truly expected.”

And not just an accomplishment, but an experience every single student will remember. “Last year, I saw my son mature more in the week that they traveled to L.A. than I had all year,” Lucy Whitaker, mom of David Whitaker ’16, said. “The responsibility he was entrusted with really made an impact.”

Within a month of finishing the race, the students started to redesign and rebuild the car for quicker speed and longer stretches of road.

After adding more solar panels, designing them on a hinge to take advantage of absorbing sunlight while the car is not in motion, and lightening the overall weight of the car, the new and improved car averaged over 20 mph during test runs earlier this summer (compared to 17 mph last year). This year’s challenge hosted by Austin Energy was a hybrid closed-track/road race event. Teams spent two days, July 21-22, at the Texas Motor Speedway and then drove their vehicles on the road to Austin over the course of another two days, July 23-24.
“We want to place this year,” Iglesias said. Placing would mean finishing in the first five cars. “And we want to continue to average 20+ mph. Last year’s winner averaged 21 mph.” Lofty but not unreasonable goals. The All Saints’ Solar Car cost around $20,000 and while most other cars in the competition stand in a similar range, they also competed against NASA-grade, carbon fiber cars that total upwards of $100,000.

Throughout the race, Ethan Fricks ’15 kept friends, family and Solar Car sponsors updated with daily emails.

“Today was Day 1 of scrutineering. With six stations to go through, the car successfully passed five of the six. Only some minor kinks on the electrical to be worked out before we are race ready!” Fricks wrote.

Day 2 of scrutineering was also a success. The team fixed the minor problems, and passed the electrical station and was officially given the “Race Ready” confirmation. As they embarked on the closed-track race, the team maintained second place in their division despite tough competition from Ben Barber High School. The team finished Day 1 of the road race at Baylor University with nearly 100 miles on the car in a single day. Day 2 of the road race proved just as strong as they arrived in Austin logging a combined closed-track and road race total 435.2 miles, and after six days of competition and three years modifying this car, the team found out just what hard work earns.

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When asked about plans for next year, the senior team captains plan on designing a separate car for the advanced division while still mentoring the younger team members as they rebuild the current car.

“My hope is to encourage students to consider science and engineering careers,” Crossley said. “We know solar energy could be the solution to the world’s energy problems but it needs to become cheaper and easier to implement. Maybe some of our students will make that happen!”

When looking toward college, senior team members anticipate majoring in subjects from business to computer science to biomedical engineering. And while the senior captains all expressed interest in working on a solar car in college (or starting a new club if one doesn’t already exist), they also recognize the impact their current work has on the future of All Saints’.

“Our Solar Saints averaged 25 mph and took home 2nd place in the National race. Amazing results from an amazing team.

Solar Car Team 2014
Captains: Ryan Drobnich ’15, Ethan Fricks ’15, Eric Getz ’15 and Nicholas Iglesias ’15
Members: Chandler Carr ’16, Carson Fricks ’16, Wyatt Kelly ’14, Emily Marcho ’14, Kevin Stadtler ’15, Sam Terrell ’17, David Vega-Pulido ’17, Jack Walraven ’15, Scott Walraven ’15 and David Whitaker ’16.
Faculty Leaders: Dr. Lyle Crossley and Joe Morris

Sponsors
The continued operation of this project is owed in great part to 15 very generous supporters: Ben E. Keith, Bird Electric, Cockrell Innovations, DFW Movers and Erectors, Eagle Railcar Services, First Choice Transport, First Rate, The Fricks Company, Hahnfeld Hoffer Stanford, Kalpakis Family, Kingdom Roofing, Lokey Metals, Mercer Metals, Mr. Motorcycle and Republic Airways. Mercer Metals actually donated all the metal for the car, and The Fricks Company donated 12 batteries, trailers for transporting supplies and the car during the competition and dedicated work space in their shop near campus. If you’re interested in supporting this innovative student project, please contact Dr. Lyle Crossley in the Upper School.

Future Impact
When asked about plans for next year, the senior team captains plan on designing a separate car for the advanced division while still mentoring the younger team members as they rebuild the current car.

“This program has taught us all so very much, and I am truly blessed to say I am a part of it,” Fricks said. “It teaches us all life lessons that will benefit us throughout our career and in life.”