On April 28, over one hundred of USU STARS! GEAR UP’s brilliant students teamed up with Greenpower USA and put their brains to the test at the Utah Motorsports Campus (formerly Miller Motorsports Park) in Tooele, Utah by participating in a Greenpower event. Student teams of drivers and pit crews from 11 schools across Utah and Nevada brought battery powered single-seat cars built by the students, with the help of their educators and 3D Computer Automated Design (CAD) programs to the race. Students prepared for the race as they worked with teachers to build their cars for the races. The students learned about force and resistance, as well as electrical and mechanical engineering, as they assembled their cars. Students spent time in after-school GEAR UP programs for up to a year building each car. The efforts paid off as students were seen having a great time as they prepared to face off in the battle of best Greenpower car. At Utah Motorsports Campus, students had the chance to participate in both F24 and Goblin car race categories. Goblin cars are the elementary school category of kit cars for students ages 9-11. F24 cars are for students ages 12-16 and help students begin learning advanced engineering techniques. Students raced, not for the fastest car but the most efficient and longest lasting battery. The cars reached speeds of nearly 23 mph around a Serpentine Kart track. Students learned quickly that the race was not only about driving skills but about the dynamics of the car itself. Some students were overheard saying that driving their racer was as “easy as driving a four-wheeler.”

Top: Jorge Topete shows off the Dual Immersion Academy racer at the beginning of the race.
Left: Greenpower cars race around the bend
Long before the race, each student learned the principles of aerodynamics as they assembled their car. They learned how air interacts with the car’s body to create drag and lift, as well as how to counteract these forces. Students learned about battery life, and how a lightweight body could make their car more efficient. Students brought their best efforts to the track to qualify for the finals. Each car ran laps of about 2/3 of a mile and in one of two qualifying races for 30 minutes. Surprisingly all cars returned for the 90-minute final race. With all motors ready to go, the racers and cars were off in a battle for the most efficient, longest lasting design.

With the results in, the winner had completed 32 laps, approximating 23 miles, in the allotted 90 minutes. The winning car was half a second faster in lap completion than the next best lap time. The winner also beat out the second place car by completing only one more lap. It was stiff competition out at the Utah Motorsports Campus but enjoyable all around. GEAR UP students who participated in the Greenpower Invitational are truly part of the next generation. We look forward to the future where we see GEAR UP students in “every company line; Tesla, Nissan, Leaf, Toyota, Prius. Our students are going to be the ones working in those corporations designing, redesigning, testing, innovating, [etc.]”, said Eric Packenham, Program Director. With the help of the Sportscar Club of America, the future of car engineering and the Greenpower transportation was truly out on the Utah Motorsports Campus racetrack for the USU STARS! GEAR UP Greenpower Invitational.

Above: Uel John of Uintah High School in his Greenpower car
Below: All students, cars and Greenpower participants enjoyed a blustry day out at the UMC
WONDERO, UT. On April 7th thanks to the USU STARS! GEAR UP partnership with the Utah Space Grant Consortium the entire student body of Wendover High School was able to enjoy an end of year STEM day. The student body was divided into two groups, junior high and senior high, and with the help of the science teachers experienced a day of science based learning. The first task was to build a hot air balloon. With directions given the students were hard at work. Upon completion the students were allowed to fill their balloon, reviewing concepts of internal and external pressure. The hot air balloons were let go over the baseball field and several escaped. One even chased a car down Wendover Boulevard. After hot air ballooning, students put their engineering skills to work as they built paper containers to protect a Pringle chip from a weight dropped on it from 7ft high. The students had the least success with gravity when only one or two Pringles made it through in one piece. However, many students tried more than once to find success in the endeavor. The last event was one of the most exciting for the students as they participated in a paper car drag race. The students made a car from paper which was placed on a PVC pipe launcher and sent off down the race track. Students learned about velocity and friction as they raced each car.

Logan High School DNA Extraction

Students at Logan High School have taken plant growth experimentation to the next level. They partnered with Paul Wolf and Janessa Lemon from the Biology Department at USU. Students used DNA extraction lab technologies to learn how DNA could be used to identify plants. The students became forensic scientists as they were given a scenario in which a kidnapped person had to be rescued, however, the only thing they knew about the location of the kidnapped individual was that there was an abundance of a certain plant in the area. The students then used the leaf sample to extract the DNA from the plant. This DNA extraction allowed them to identify both the plant and where the person may be. This scenario led students to think about potential careers and majors using forensics and DNA that they could start into when they enter college.
In February, over 700 teachers participated in the Utah Science Teachers Association Conference. As part of this conference, GEAR UP science teachers participated in three activities on design concept, force and motion to take back to their classrooms. In their first activity GEAR UP science teachers made containers to hold and protect an egg as it was launched into the wall. They discussed force and motion, along with how the shape and design of the container could protect the egg from becoming scrambled.

Next, GEAR UP teachers were given the task to design a paper sailboat that when blown by a fan, would travel on a long string. Design concepts were discussed as some boats were too heavy, while others were too narrow. Teachers redesigned boats until all could make the journey.

Last teachers designed scribble-bots. Scribble-bots are tiny robots made out of a motor and miscellaneous supplies. The object was to get the robot to draw a shape, such as a straight line or a complete circle. Teachers learned that the vibration of the motor allowed the robot to move and a discussion of waves and motion followed.

USU Parent's Weekend

At the beginning of this year on January 17, Utah State University STARS! GEAR UP hosted parents of 9th and 10th grade students from across the state for an overnight conference at the Logan Campus. The conference was initiated this year as an outreach effort to educate parents about the resources USU STARS! GEAR UP provides to help their students in pursuing secondary education. Parents attended workshops provided by several USU Student Affairs offices including Admissions, Advising, and Financial Aid. Six current USU students participated in a panel to talk about their journey to college and college life. After the panel, Melanie Domenech Rodriguez and Rick Cruz, Professors in the Psychology department led parents in a discussion about their fears, hesitancies, and questions about their student and college. After the workshops, the parents attended the Fiestas Americas event put on by the USU Latino Student Union, allowing them to experience firsthand the community and atmosphere of a college campus event.