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University School
NOVA SOUTHEASTERN UNIVERSITY

Middle School Students Embrace Tough Science Projects

University School's special access to mentors and resources allows Middle School students to adopt science fair topics about which they can be passionate, but such pursuits often require additional work by both the student and teacher. To start, all projects are screened by a safety review committee, receive parental approval and must adhere to a lengthy checklist. If a project entails the use of chemicals, hazardous devices like x-ray machines, biological agents like microbes, or human subjects, additional review by a qualified scientist is required. Such was the case with this year's 1st place winner at the school level and 2nd place winner at the regional level, Andrew Hurowitz. As a precursor to developing his science fair experiment, grade 8 student Andrew created a fake Facebook page to observe whether people would "friend" someone simply on the basis of having mutual friends. After witnessing a snowball effect that resulted in more than 500 "friends" for a fake profile, Andrew's official hypothesis began to take shape.

"[University School teachers] are pretty open to ideas," Andrew said. "They want you do something you are passionate about and will have fun with. I find social behavioral science to be the most interesting. I realized [after the Facebook test] that I wanted to do a project on conformity among teens and elementary school students."

Andrew devised an experiment to explore how students in the two age groups were affected by peer pressure. First, he asked a group of 10 teens to compare several sets of lines. All but one student were coached to correctly identify the shortest line in the first six sets. When the subsequent set was shown, however, the coached students one-by-one incorrectly identified the lines. It was up to the last student, then, to agree with his or her peers or to identify the correct answer despite their responses. The experiment was repeated with Lower School students.

"The teenagers succumbed to peer pressure 40% more than the younger students," Andrew said. "I think this is because the Lower School students don't really care what other people think of them while teens are trying to fit in as much as they can." A science fair participant since kindergarten at University School, Andrew added that the take away from his project is: "You should always do what you think is right, not what others think. You should have your own ideas and not conform and give into peer pressure."

University School science curriculum coordinator and teacher Ms. Dixon said that she was impressed by the quality of research and display boards produced by the students whose projects progressed to the regional level as well as by the tenacity exhibited by students whose chosen topics required additional project management, or in one case abandoning the student's initial hypothesis and research. Andrew's project was difficult, Dixon cited as one example, because he had to recruit a lot of participants, acquire the permission of two division directors and devote extra time to group coordination and the actual experiments.

Broward Country Science Fair Results:

2nd Place Winner:

Andrew Hurowitz	Behavioral Science: "The Power of Conformity"	Grade 8

3rd Place Winners:

Ryan Albright & Emma Gellman	Botany: "Algae Analogy"	Grade 7
Marissa Gailitis & Saachi Jain	Botany: "Rad Beans"	Grade 7
Madeline Smith & Danielle Stocks	Physics: "Eco-Friendly Lights, They're Cool"	Grade 7
Soryan Kumar	Chemistry: "Energy from H2O: The Search for a Catalyst"	Grade 8
Rhys Murray	Botany: "Algae Explosion"	Grade 7

For another project, grade 8 student Caitlin Cahalin decided to take advantage of Ms. Dixon's contacts at NSU's Oceanographic Center and conduct a marine life project involving dissection. Caitlin initially planned to study the stomachs of lionfish to qualify the havoc the invasive species is suspected to be wreaking on Florida's fisheries. Unfortunately, she found that the contents were too well digested by the time the fish reached the lab table, which meant she had to find a new science fair project. She began dissecting yellowfin tuna under the mentorship of NSU Research Scientist & Adjunct Professor Dr. Kerstetter. After logging numerous dissections, Caitlin discovered a correlation between the amount of identifiable content found within the stomachs of the fish and the fishing methods used to capture them.

"I realized that different fishing methods were being used – long line and green stick – and that fish would have more or less digested stomachs as a result," Caitlin said.

She went on to explain that using one long line with an extensive series of hooks meant that fish stayed in the water longer before coming onboard. Conversely, the green stick method resulted in fish being reeled in more quickly. The extended or shortened digestion time was accordingly apparent.

"The lack of a good lionfish sample size and content findings meant that Caitlin didn't have a hypothesis until she started examining the other species of fish," Dixon said. "That is science, though. It is not always cut and dry. Sometime it is 'let's open up the subject and see what is in there'." Caitlin added that the key is to know how to record and prioritize data. "You have to be really careful with your measurements, perform steps at the right time and analyze the data a lot," she added.

Regarding the opportunity she had to conduct research at NSU's Oceanographic Center comprising an 86,000 sq. ft. facility and marina on 10 acres, Caitlin noted: "I could tell that everything was all new. I really like marine biology, so it was fun for me to see the NSU lab, to learn more about marine life and to be able to work there."

In addition to the unique availability of NSU equipment, facilities, professors and other professional contacts, Ms. Dixon credits the online platform used by University School and college students, Blackboard, for enhancing the process.

"The students have to do the work and build relationships from our connections, but I mentor them and look at every part along the way," Dixon said. "This year we used Blackboard to communicate so I could sit at home and read each piece of data as students uploaded them. As a result of the constant feedback, students were able to strengthen their hypothesis and adjust presentation plans before getting to the display board stage. It is difficult to manage so many projects, but Blackboard made it easier and actually improved the quality of the work."

Out of nearly 600 projects, nine of 10 University School qualifiers received Broward County Science Fair Awards. Ms. Dixon commended all the students who reached the county level. She also thanked the English teachers who worked collaboratively to help students prepare the accompanying written report.

"Every winning student placed second or third, which was amazing," Dixon added. "Students put in a lot of time and effort to get projects to county, and then there is the extra time required outside of class and above their normal work to continue and prepare the next level of research books and paperwork. Most students are in high-level classes so the dedication is pretty outstanding."