While flying robots in our schools might sound straight out of a summer blockbuster, it’s actually a powered-by-Flight Night STEM education initiative that’s priming student minds for success in college and beyond.

By providing hands-on experience in designing, building and piloting drones, the program teaches problem-solving skills and teamwork, growing student confidence and competence as creative, critical STEM thinkers and learners.

It ultimately allows young people to envision themselves excelling in science, technology, engineering and math – creating what is known as their own STEM identity.

According to Xan Black, executive director of Flight Night beneficiary Tulsa Regional STEM Alliance, the program launched in 2015, when 10 teachers received drone-related professional development as well as classroom drone kits, all offered free of charge.

That year, 40 high school students built drones at school, with 21 submitting “Quadcopter Showcase” entries.

The next year, middle-school teachers and their students were added. A local high-school robotics team, Jenks’ Prime Movers, was tapped to design and set up a challenge course, establish rules, write a play book for teams preparing to compete, and score entries. With that, the showcase transformed into the Flight Night Drone Competition.

“It was a dream come true,” Black said, noting that significantly more teams entered in 2016, vying for “a trophy, high-fives, and all the glory that goes with having won a drone competition.”

CONTINUED...
IMPROVING math proficiency through one-on-one mentorship

Through Flight Night proceeds, Me and My Math Mentor is able to pair elementary students with STEM professionals for a game-based, 30-minute per week mentorship session.

Preliminary data indicates students participating in Me and My Math Mentor can build math proficiency and surpass national testing averages compared to students not participating.

Flight Night Mobile Fab Lab programs also build core skills in math and science through hands-on learning and problem solving. According to pre- and post-impact surveys:
- 93% of participants gained a sense of confidence;
- 88% understood how what they learned relates to concepts from school; and
- 82% were motivated to do better in school.

BUILDING STEM career awareness and self confidence

Flight Night-funded programs and events, such as the Back-to-School STEM Expo, have introduced more than 5,000 middle-school students to the variety of STEM careers they might one day pursue right here in Green Country.

After participating in the Engineer Games, 46% of students felt they could be an engineer.

Before and after participating in Fab Lab Tulsa and Flight Night Mobile Fab Lab workshops, student surveys showed:
- 95% had an increased interest in engineering and technology;
- 91% had a better understanding of how engineering is used to solve real-world problems; and
- 95% had discovered new ways to use technology.

INSPIRING girls and other underrepresented minorities

The Me and My Math Mentor program serves a large percentage of economically disadvantaged, English-language learners and students of color.

Participation by female students in Flight Night-powered Tulsa Regional STEM Alliance programs has reached 56.1%.

46% of girls in TRSA programming reported an increased interest in a job or career in a STEM field.

INVESTING in educators as STEM thought leaders

Five outstanding educators committed to STEM subjects will win STEM Innovator Awards of $2,500 or more at Flight Night in September.

In 2018, 1,330 teachers received professional development and classroom grants from Flight Night awarded funds including Science of Flight, STEM Innovator Awards, Drone Institute, Space Week, USNA SeaPerch and Fab Lab Tulsa teacher training.

Flight Night’s support of the TRSA “STEM Shoppe” helped provide almost $153,000 in classroom materials in 2018.

Our investment in teachers and STEM resources for classrooms influenced an estimated 155,266 students last year.
Invasion of flying robots

“The stories we hear from parents and so forth is that it was a real turning point in the lives of students to really empower them and let them see that, ‘my goodness, you know: I am that STEM identity, I am a STEM person’,” Black said.

“Like, ‘I have been able to build a robot that will fly and do what I want it to do.’ It’s pretty good for the ol’ STEM identity,” she added. In 2018, 58 teachers participated in drone-related professional development – a long way from the 10 who trained just a few years ago – and gave teachers and students 254 drone kits. Black says she can only imagine how many teams that’s going to be. “We calculate just the drone part of the work we do in STEM education through classroom grants and drone grants will impact over 14,000 students – strictly through this drone program that Flight Night makes possible,” she said.

Black tells Taking Flight the very existence of this successful drone competition is directly attributable to “the fertile imagination of” board member Bailey J. Siegfried, who was the first to envision Flight Night bringing such a program to life.
Hand-held holograms = fun + learning

Guess what Oklahoma students are doing at school these days? Carrying textbooks in backpacks: Check. Drinking milk from tiny cartons: Check. Controlling holographic objects in the palms of their hands? Believe it or not: Check! Manufactured by Austin, Texas-based MERGE Labs, the award-winning MERGE Cube uses augmented reality and a phone’s camera to transform anything you can imagine into a 3D holographic object. The company generously donated 400 of these little marvels for demonstration at Flight Night, followed by distribution to area schools. MERGE says they work with toys because in every generation, toys create the future of kids. Locally, teachers are using MERGE Cube augmented reality to build their lessons, giving students the power to create and manipulate 3D models of virtually any object – a molecule, a dinosaur, a distant planet: The STEM learning possibilities are endless.

My dreams for the kids I teach are that they will experience flight. That what they are given in my classroom will make them driven to one day make enough money to fly in an airplane and look down on the tops of the clouds.”

Susan Spradlin, Educator
Wagoner Public Schools
Your support is a force multiplier

A galaxy-sized 'thank you' to our Flight Night 2018 sponsors. You’re helping us inspire confidence, curiosity and imagination with curriculum, tools and events that bring the STEM fields to life for the next generation of Oklahoma workers.

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FLIGHT NIGHT GIVES STUDENTS A BOLD NEW MISSION
Offering both curriculum and associated professional development, Flight Night turns area schools into their own combo scientific-research and mission-command centers, with students designing and launching experiments into micro-gravity to test the theory of transformative change. #PoweredbyFlightNight
As an Autumn rain gently muddies the grounds of Unity Elementary in west Tulsa, Mr. Bigby’s fourth-grade afternoon class chats and fidgets, seated at round tables of about four students each, awaiting a lesson on landforms.

But this isn’t your typical science lecture: Unity is one of four Tulsa Public elementary schools participating in a powered-by-Flight Night series of in-classroom, interactive video conferences with experts on the floor of the Smithsonian’s National Air and Space Museum in Washington, D.C.

Mr. Bigby corrals class attention in preparation for the call.

“Class! Class!” he says. “Yes? Yes?” comes their answer in unison. He repeats this call and response until all students are focused on the front of the room.

“What are the different processes by which landforms are created?” he writes on the board, followed by “How do the surfaces of planets & moons change over time?”

“Is the moon a planet?” a girl calls out. No, Mr. Bigby tells her, promising to get into the difference between moons and planets in a lesson planned for February.

“My birthday is in February,” says another student. “So is mine,” adds another.

The video conference opens with two senior Explainers introducing themselves as recent college graduates with a passion for science. Next is a series of brief video clips of Ph.D.s explaining various geological concepts at kid level, as well as photos of land masses on Earth and elsewhere in the solar system.

In the classroom, each table receives a clear, plastic storage-type box, two plastic cups filled with flour and two filled with sand. The substances represent Earth’s varied sediment. The students take turns pouring a thin and even layer of flour into the box, then a thin and even layer of sand; then flour, then sand again. With the layers in place, a student at each table slowly pulls a piece of cardboard lengthwise across the plastic container.

“OBSERVATIONS,” Mr. Bigby writes on the board. “At first, it looked like... Then, we...After, it looked like...” Multiple hands go up.

“Before, the flour and sand was flat and smooth, but afterward it was bunched up together,” a student answers. “It became a ‘mountain’,,” offers another.

“Great observations,” an Explainer replies. “This is what happens when tectonic plates move and push rocks and soil together. Do you know what tectonic plates are?”

No, the class says.

The Explainers display a map of the Earth on the video conferencing screen.

“The red lines are the tectonic plates. These are always shifting, and over time, they change and create landforms like the ones you just made.”

A few students from Mr. Bigby’s morning class are present to show their experiments, which entailed pouring water on the sedimentary layers to simulate rainfall. The Explainers ask them what hypotheses they’d made about introducing the water.

“Hypothesis?” a boy asks, looking to his teacher for a definition.

“Yes, ‘hypothesis’,” Mr. Bigby says. “A guess. What did you think would happen?”

“I thought the water would disappear, but it didn’t. It stayed in a puddle on top,” the boy answers.

“Like a lake,” an Explainer points out.

With the lesson complete, the Explainers allow time for the nine- and ten-year-old students to ask questions about landforms, the museum, or anything else that is on their minds.

...How are biomes created?...How are volcanoes made?...What was on Earth before there were people?...Are you rich?...How did you like college?...Can I come to visit the Air & Space Museum? Aptly named and true to their word, the Explainers explain it all.
Without funding from Flight Night, the hands-on activities, real-life experiences, and field trips to educational venues would seldom happen.

We want our students to not only leave our school building on a high academic level, but to also have tools in their toolkit to use for their future.

Coding and piloting drones, touring NORDAM, and experiencing the Tulsa Air and Space Museum, have been seeds planted that will grow our students into future careers in the science, technology, engineering, and mathematical fields.

I have personally seen the sparks in their eyes and have heard the excitement in their voices as my students in pre-K through 5th grade have had these amazing experiences due to donors like Flight Night."

Barbie Jackson, STEAM Teacher, Limestone Technology Academy, Sand Springs
Make plans now to attend the sixth annual Flight Night, featuring an outdoor reception with live aerial entertainment, followed by dinner, a live auction and award presentations. With your support, we’ll continue to inspire, educate and empower today’s students and tomorrow’s tech-savvy workforce.

Sponsorship Information: TulsaFlightNight.org