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BEETLES IN SPACE: STUDENTS PREPARE TO LAUNCH "CLASSMATES" TO THE UPPER STRATOSPHERE

(BOISE) – Students in Lisa Washburn's sixth-grade science class in the small, rural Culdesac School in Culdesac, Idaho, are preparing to launch some of their "classmates" to the upper stratosphere as part of NASA's Cubes in Space program.

Their "classmates" are some flour beetles used by Washburn's class in other science projects, who will be sent nearly 130,000 feet toward the edge of space in an effort to measure the effects of radiation and low atmospheric pressure.

The students will pack them aboard a 4-centimeter square cube, a miniature satellite canister known as a CubeSat, which will be launched in August from NASA's Columbia Scientific Balloon Facility in Fort Sumner, N.M. At that altitude, hanging from the wispy, transparent balloons, the beetles will be exposed to atmospheric pressure 1 percent of that found at sea level and be exposed to ultraviolet, x-ray and gamma radiation that is mostly blocked by the earth's atmosphere.

"This is an amazing experience that we actually get to send flour beetle larvae into space!" said Mackenzie Darnell, one of Washburn's students in the small K-12 school of the Culdesac Joint School District that serves about 97 students, total, in northern Idaho about 24 miles east of Lewiston.

Washburn teaches all of the district's required science classes for grades 6-12, plus science instruction in the elementary grades, and is the coach of the school's Lego and Tech Challenge robotics team. It helps, she said, that her maximum class size is only 12 students, but juggling science classes at all those different levels keeps her "pretty busy," she admitted.

Inspiring students is part of her job, and the CubeSat project has them pretty excited. "It's going to be interesting to see the effects of radiation and low air pressure on the beetle larvae," said Joss Reid, one of the students who will help analyze the results of their experiment.
The beetles they will use are more than just subjects in the science lab, however. "We kind of joke that they are the class mascot," Washburn said.

""They are cute and we get to send them into space!" one of Washburn's students said.
The project began when Principal Chase Woodford forwarded a "Cubes in Space – NASA" competition announcement to Washburn. "I talked to the kids and they thought it would be cool to send some of our classroom flour beetles into space." Cubes in Space™ is an idoodlelearning inc. program in collaboration with NASA's Langley Research Center and the Colorado Space Grant Consortium. It offers global design competitions for students 11-18 years of age to develop STEM-based experiments for launch into space. This year, nearly 500 educators and thousands of students from 22 countries participated and proposed experiments for space on a NASA suborbital sounding rocket or high-altitude scientific balloon mission, of which a total of 160 designs were selected.

"Ours was chosen because it was unique I believe," Washburn said, and NASA has an interest in how living creatures are affected by low atmospheric pressure and high doses of radiation.

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Her students have been working on the project since this winter. "After coming up with the idea, the class did some preliminary work on the internet to research previous experiments regarding insects in space and then we put together our proposal," she said.

"Flour beetles undergo a complete metamorphosis," Washburn explained, "meaning the egg hatches after four days, then comes the larval stage for two weeks, the (two-week) pupal stage is next and then the pupae become adult beetles." The larvae will be randomly chosen using a coin toss, then put into small vials inside the 4x4x4-cm ventilated cube, mailed in the cube to NASA a maximum of two weeks before the flight, and then sent into the upper stratosphere and returned.

After the "space beetles" return home, the students will monitor their mortality rate. "We will run statistics on them using an easy to use "R" program. An identical control experiment will be set up in our classroom at the same time," Washburn said.

It's not just the students who are anxiously awaiting the launch. "The entire school is excited and interested, including the parents and the community," Washburn said.

In the small town of Culdesac, a school, a teacher and her students, have proven that every Idaho student can get a STEM education that is out of this world.

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Cutline: From left, Culdesac School sixth-grade students Justice Balentine, Daniel Wing, Mackenzie Darnell, Joss Reid, Conrad Dudley and Austin Blosser, work on getting their "space beetle" experiment for NASA ready.