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BRIAN DAVIES/The Register-Guard

Hamlin Middle School student Cris Jones, 13, learns computer programming with the help of University of Oregon computer science students Elva Zhang (left) and Felix Pan (right) during "Mad Duck Science Days" on campus.

# INTO SCIENCE LAB WITH 'MAD DUCK'

## Springfield students get hands-on experience in UO program

BY LESLIE RUTBERG  
For The Register-Guard

Many middle school students spend their no-school Fridays sleeping in and playing video games. But last Friday, 20 students from Hamlin Middle School got up early and came to the University of Oregon to build their own video games.

Graduate and undergraduate students from the Computer Science department helped them to develop simple games using an animation program called Scratch. Friday's event was part of "Mad Duck Science Days," a partnership between the Springfield School District

and the UO that brings middle school students to campus for extended hands-on science lessons.

UO chemistry professors Mike Pluth, Shannon Boettcher and George Nanzin initiated Mad Duck Science. They knew that budget cuts in many public schools meant less class time, less equipment and higher student-to-teacher ratios, which made hands-on science labs increasingly rare.

So they met with the district to identify ways to immerse students in the fun of exploratory science without encroaching on already scarce class time. They decided rather than bring science to the school, they would bring students to the science.

Mad Duck Science brings up to 25

students to the university for such laboratory activities as electron microscopy, exploring states of matter by freezing ice cream with liquid nitrogen, and building batteries out of everyday objects such as Gatorade and pickles.

The Mad Duck Science labs are much longer than regular classroom labs, which have to be completed in just 50 minutes, including set-up and clean-up time. They also have many more instructors available for help: At Hamlin, one teacher supervises 35 students, but at the UO labs there's one instructor or assistant for every two students. Those resources, and access to UO's equipment, allow students to com-

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# Science: Students get chance to see themselves as scientists

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plete more complicated and challenging projects.

Jason Hackley, a chemistry graduate student who assists with many of the labs, says students have been particularly enthusiastic about the Solar Car lab where they compete in teams to build the fastest model car powered by solar panels; the kits for building the cars are donated by the Eugene Water & Electric Board.

"They also really enjoy the snap circuits and things like electricity and magnetism," says Hackley. "We learned how an electric motor worked, and light bulbs. They like the Van-degraff generator (the classic glass globes with what looks like lightning inside). It made their hair stand on end and one student screamed from surprise."

The Hamlin students also had the opportunity to tour UO labs and meet with graduate students and researchers. Pluth said he hopes the program encourages students

to broaden their idea of what happens at the university.

"The kids tend to associate the UO with the sports teams, (so) it's nice for them to see there's so much more going on here," he says.

Boettcher says one of the program goals is to help students see what science looks like in practice.

"Most of these students know a doctor, or a teacher, or a lawyer, but not many of them know a scientist," he says. "It's critical for them to see science, to know what a scientist does, if they are going to see themselves as scientists one day."

The lunch break is Boettcher's favorite time to engage students in more unstructured scientific exploration. "It's a good time to chat," he says. "We toss a Frisbee and talk about why it moves the way it does."

Paul Griffith, coordinator of out-of-school programs for the Springfield district, can attest to that: "Shannon has ruined a number of Ultimate games with lectures about the physics

of how a Frisbee flies."

Kidding aside, Griffith says the experience of working directly with UO scientists has been amazing for his students. His favorite moment from past years' labs was seeing a crowd of 50 staff, faculty and graduate students gather in the Williamette Hall atrium to watch Hamlin students compete in an "egg drop" contest, where they designed cradles for raw eggs; then dropped them from the fourth-floor balcony to see which eggs would survive the fall.

"It was really encouraging for the kids to see adults looking at them as scientists," says Griffith.

Many of the Mad Duck Science instructors can still recall their own early experience to science as the spark that fueled a lifetime pursuit. Pluth's father was a middle school science teacher and took him along on a field trip to see a laser facility, an image that inspired his curiosity and drove his pursuit of research science.

Hackley remembers his

father, a mechanical engineer, showing him the function of a bridge rectifier, a circuit that turns AC to DC. He recalls that the explanation opened up a whole new world: "That stuff always seems like magic until someone explains it to you," he says.

Emily Schwartz, a computer science graduate student and the leader of Friday's activity, remembers as a freshman in high school writing her first computer program, a simple text-based role-playing game, on a graphing calculator. On Friday, she shared that moment of discovery with the students from Hamlin.

In her lab, the students worked in pairs to piece together blocks of commands that sent animated creatures whizzing across the screen, sometimes in erratic and unpredictable ways. One pair's soccer player sped several paces past the ball, rather than kicking it as intended. Schwartz encouraged them to move carefully through their game programs to identify commands that might be caus-

ing the malfunctions, then rewrite to make the animation cooperate.

Robert Rust, 14, is an eighth-grader who has attended every one of the labs since the program began. He says his favorite part of the program is meeting all the graduate students.

"You get to hear about what they do and learn about all kinds of science, like why wintergreen mints release a spark when they are broken," says Robert, who plans to pursue theoretical physics.

Paola Lopez, 13, said one of her favorite activities was the tour of campus and the underground Lokey labs. "We got to see a tree that had gone to the moon, and we saw a lot of scientists doing research on computers. It was pretty cool."

Before turning back to the screen and continuing to make her game, Paola noted that she didn't mind getting up early to take part in the UO lab. "At school, we take notes and watch videos, but here we get to touch stuff and play," she says. "It's hands-on."