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A teaching model that would make Da Vinci proud

At Da Vinci Science High and Da Vinci Design High, students learn by producing elaborate projects -- paper roller coasters, models of Chicago tenements, children's books from scratch.

By Mitchell Landsberg

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Ninth-grader Ricky Barrow, 16, works on a project in lieu of a final exam at the design school. Team projects and technology are hallmarks of Da Vinci's curriculum. (Francine Orr / Los Angeles Times / December 16, 2009)

The Annihilator is a death plunge of a roller coaster that begins by dropping the rider through a wide, fast funnel. It swooshes down a gut-wrenching series of S-curves, flies through a 360-degree loop, slides down a straightaway to another funnel and then -- this is the moment of greatest terror -- free-falls into a basket.

Alas, thrill seekers, you will never ride the Annihilator.

It stands about 4 feet tall and it's made entirely of paper. Only marbles ride the Annihilator, which is intertwined with another paper roller coaster, the Epic Fail, so named because high school teacher Mario Rodriguez seemed unable to test it without having the marble fly off the track.

The Annihilator and the Epic Fail were among the ninth-grade science projects on display recently at the new Da Vinci Science High School in Hawthorne. Beyond the improbability of paper

roller coasters, what stood out was the unbridled enthusiasm of the students who built them as an engineering class assignment.

"We learned about potential energy, kinetic energy, velocity and the conservation of energy," said Verann Lambert.

"It starts off with potential energy," said classmate Marianna Correa, "and then once it starts going down, the potential energy begins to turn to kinetic energy. The velocity is how fast it goes, and then the law of conservation of energy is because in the end, you will wind up with the same amount of energy from the top to the bottom . . . but only if it's perfect, no bumps, no friction."

Verann butted in. "Velocity," she said, "equals the square root of the kinetic energy divided by 0.5 times the mass."

Joined by fellow team members Elijah Hernandez and Sandy Sanchez, they seemed capable of talking this way all night.

Da Vinci and its conjoined twin, Da Vinci Design High School, are one vision of the future of education. They trace their lineage to two celebrated charter schools, High Tech High in San Diego and Camino Nuevo High in the Westlake area of Los Angeles. Like Da Vinci, those schools employ a "project-based" curriculum that allows students to learn through hands-on projects, often involving teamwork and computers.

What sets the Da Vinci schools apart is more political than pedagogical. These schools are part of an unusual battle between two overlapping school districts -- one highly successful, the other not.

The Da Vinci schools opened in August, chartered by the tiny Wiseburn School District in an area that encompasses parts of Hawthorne, El Segundo and an unincorporated chunk of L.A. County.

Wiseburn -- established in 1896, according to its website -- is an elementary school district, only allowed to operate traditional elementary and middle schools. Its schools are known for high academic standards and excellent test scores, and for doing something that very few districts anywhere have done -- eliminating the "achievement gap" separating black students from their white and Asian peers.

Students from Dana Middle School are supposed to go on to Hawthorne High School, a low-performing campus that is part of the troubled Centinela Valley Union High School District. Many avoid it by finding *(continued next page)*

A teaching model that would make Da Vinci proud *(cont.)*

a way into neighboring districts or private schools. For years, residents and administrators in Wiseburn have dreamed of establishing their own high school.

To do that, they needed to create a "unified" school district, with elementary, middle and high schools. But a years-long effort sputtered in 2004 when the Centinela Valley district sued Wiseburn, arguing that its petition to expand was invalid because it lacked an environmental impact statement.

Not long after, district officials came up with a new idea: A charter school.

State law allows an elementary district to authorize a charter high school, a public school that operates independent of usual district rules and bureaucracy. And so, at a time when many school districts were fighting charters, which they saw as competition, Wiseburn decided to open one.

So began the Da Vinci schools, run in the buildings that formerly housed Dana Middle, which moved into new quarters next door. Parents and students, by all accounts, have been delighted.

"I love it," said Crystal Brown, whose son Doriyon is a freshman at Da Vinci Science. "I love the diversity. I love the atmosphere. It's great."

Together, the schools have 448 students. The design school offers only ninth grade this year; the science school has ninth and 10th. They will expand by one grade a year.

Matthew Wunder, the former principal of Dana who runs the charters, said they have attracted students from 96 schools in 38 ZIP Codes. The largest contingent -- about 160 -- attended Dana last year. Wiseburn Supt. Tom Johnstone said his district used to send more than 40% of its middle school graduates to Centinela Valley schools, despite "deep, deep dissatisfaction." This year, he said, that figure dropped to just under 8%.

Wiseburn is still trying to become a unified district and expects a ruling from the state Board of Education in March. Centinela Valley Supt. Jose Fernandez is opposing the change, which he said would rob his district of nearly half its potential revenue from school bonds. "It gets down to the matter of, is it good public policy to take away the resources of a wide area . . . to benefit a few? I don't think it is," he said.

Meanwhile, nearby corporations, including Northrop Grumman, Raytheon, Chevron, Boeing and Belkin, have lined up to support the new schools with money and time. Northrop Grumman donated \$135,000 for a new "innovation lab" that will put an array of sophisticated tools at students' disposal.

Students praise the school for, among other things, challenging them and making learning fun.

The roller coasters were, in effect, the final exams for the fall semester in engineering, one of the core classes that all students take, combining math and physics-heavy science. Next door, students in a humanities class presented their project: Reading to younger siblings from children's books that each freshman wrote, illustrated, printed and bound.

"It's not like other high schools," said Gerry Gutierrez, who had just finished a dramatic reading of his book, "The Adventures of Pepe the Stick Man." It told the inspiring tale of a stick figure who saves the world of illustration from an evil giant eraser.

Another highlight was the Chicago tenement district that 10th grade humanities students created in their classroom after reading "The Jungle," Upton Sinclair's searing novel about meatpackers in the early 20th century. Students used cardboard to create tenement rooms, displayed dozens of photographs from the era, put up red-stained chains to simulate a packinghouse and even brought in a live chicken, which somehow survived the evening in an ersatz slaughterhouse.

The exercise, students said, brought home the conditions described in the book, which they discussed with sophistication.

Jared Copher was wearing a bloody apron, his arms stained red, his neck and face streaked with fake blood. He attended Hawthorne High last year but transferred to Da Vinci for 10th grade. "It's like night and day," said his stepmother, Kathy Gimelli.

At Hawthorne, Jared said, his classes were "pretty boring" and he wasn't inspired by the challenge of scoring well on a test. "But here," he said, "on a project, you have almost a limitless potential."

He could think of just one downside, the result of the close relationships he has formed with teachers and staff: "Here, if I wanted to get away with something, I couldn't."