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Physics as a practical matter

By VALERIE RUSS
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Science Leadership Academy teacher Rosalind Echols (second from left) helps students with a demonstration of acceleration. She'll be presenting her ideas at a conference this weekend.

Students in Rosalind Echols' physics class at the Science Leadership Academy think about what they're learning even when they're not in school, like when they're playing soccer, or taking SEPTA.

"While I'm running on the soccer field, I'm thinking about whether I'm accelerating in my speed, or whether I'm in constant velocity," said Ashley Melendez, 17, a junior at the Center City magnet school.

Echols' students think about physics on SEPTA trains, buses and trolleys because she uses her students' travels to help them understand Isaac Newton's Laws of Motion.

If you're standing on a moving train and not holding onto a pole, she asks, will you keep your balance better if you stand with your feet wide apart or close together?

Echols, 27, who has just four years' experience, will present her innovative physics-learning project this weekend at the National Conference on Science Education, which starts tomorrow at the Pennsylvania Convention Center and at nearby Center City hotels.

The National Science Teachers Association is sponsoring the conference, and 10,000 to 12,000 teachers are expected.

But Echols, who also is a fellow with the Knowles Science Teaching Foundation, won't be the only relatively new teacher in the spotlight. Knowles Fellows, who are all young science and math teachers, will have a reception at the Franklin Institute tomorrow night.

The Knowles Science Teaching Foundation, based in Moorestown, N.J., is a national advocacy organization for improving the quality of math and science teaching in high schools.

Of 131 Knowles Fellows around the country, Echols is one of four teaching in Philadelphia.

Echols, has taught physics at the Science Leadership Academy for two years. Before that, the Princeton mechanical-engineering grad, who has a master's in education from Penn, taught at University City High for two years.

Through the fellowship, she and other new physics teachers attend semiannual meetings and workshops and discuss how to become better at what they do. Then, every summer, fellows meet with all the other science and math fellows from around the country.

The fellowship program targets those with little to no experience - it's open to college students or teachers at private schools who haven't earned teaching credentials - because Harry Knowles, co-founder of the foundation, believes it's better to influence new teachers before they start their careers, said Angelo Collins, the foundation's executive director.

Knowles, an entrepreneur and inventor of the handheld bar-code reader, created the foundation in 1999 with his wife Janet.

Collins said the program not only tries to attract bright young people into careers teaching science and math, but also encourages them to stay long-term.

"We believe teaching is really complex and it's an intellectual challenge, and it takes time to make a master teacher," Collins said.

Echols is working with a Drexel physics professor and hopes to prepare her students' findings on riding SEPTA for pamphlets that can be given to the riding public.

For example, one student's findings explained why a toddler should not be allowed to stand on a train holding a pole by himself.

"The applied force needed for the child to keep his balance is about equal to the force needed for him to carry a heavy bag of groceries," more than the toddler could handle, Echols said.

And that adult standing up on the train without holding on, will better keep her balance by standing with feet wide apart, rather than close together.

A wider stance provides the force of friction for the passenger to better maintain balance, Echols said.