The Greenhouse Effect

How urban farming is transforming science education. By Debbie Koenig

Sidsel Robards and Manuela Zamora had an aha moment when they chaperoned a second-grade class trip to New York Sun Works's science barge. They saw an opportunity to introduce real-world sustainability and nutrition concepts to an urban curriculum. The two moms joined forces with New York Sun Works to build a hydroponic rooftop greenhouse at their kids' public school, which grew into a nonprofit program aiming to install hydroponic greenhouse labs in 100 NYC schools by 2020 (26 are completed or in the works). Here, Robards talks about how the Greenhouse Project is breathing new life into science education.

The lettuce grown by students in rooftop gardens eventually makes its way to the school's salad bar.

Why build greenhouses?

We found that teachers have a real desire to educate through farming: kids learn so much better with hands-on projects, and farming incorporates concepts from multiple subjects—biology, chemistry, environmental studies, nutrition. But there wasn't a way to tie it into the curriculum here—most schools in the city don't have space for farming on school grounds, and even if they do, the main growing season falls outside of the school year. We took the required science curriculum and adapted it to teach it through sustainable farming indoors.

What happens in a greenhouse classroom?

In younger grades they start with the basics, with a big focus on systems thinking. By middle school, kids are designing hydroponic systems for a "client." They design the systems to fit the space, decide what to grow, write a manual. You'll overhear them talking about pH and electric conductivity and nutrient levels—the students absorb it without focusing on it. They're making sure the plant gets water, sun, nutrients—everything it needs—and they can immediately see if the plants are healthy or not. After that, it's easy to get the kids to look at their own bodies as systems. Instead of just saying, "Eat healthy," you can ask them, "What does *your* system need to thrive?" The vegetables grown are served in the lunchroom—and if there are extras, they're donated to groups in the community.

What do you hope will be the lasting effect of the Greenhouse Project?

In a few years, the first kids who learned in the greenhouses will be graduating high school and going out into the world. Whoever they become, hopefully we'll create a generation of people who have a much better understanding of what their impact on the environment will be.

PET NUTRITION

How do I evaluate and choose the best pet food?

The simplest thing you can do is to check your pet-food label for the Association of American Feed Control Officials (AAFCO) statement. AAFCO establishes the nutritional standards for complete and balanced pet foods (for example, for every 100 calories, AAFCO requires 5.1 grams of protein for dogs and 6.5 grams of protein for cats, and there are similar requirements for 36 other essential nutrients). Foods that meet those standards will have a statement on their product. Foods that are not complete and balanced will say they are for "intermittent or supplemental feeding" only.

If you want to go a few steps further you could also research the pet-food company and make sure an expert (a Ph.D. in animal nutrition or a board-certified member of the American College of Veterinary Nutrition) is formulating the food or consulting on the recipes. And if your pet food touts a health benefit, such as "helps your pet live a longer life," checking if there are studies to support these claims is also valuable. The most credible studies are published in peer-reviewed journals. This information is sometimes on the company's website, but don't hesitate to ask them directly. Both of these steps, however, will require some digging.

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