

For the past 16 years, Richard Therrien has been working as the k-12 science supervisor for New Haven Public Schools. Part of Therrien's job includes overseeing all of the science curriculums for all of the schools in the city. He says that environmental education is included in every curriculum in New Haven Public Schools, but like every subject in the curriculum, especially at the elementary level, the challenge of incorporating it into the classroom is mostly "an issue of time for science in general. It's not as if environmental education is designed in favor of other sciences. For elementary teachers, life science is probably the one subject they tend to go to and are more comfortable with."

Therrien says that New Haven Public Schools work with a lot of partners, including Common Ground High School and outside nature centers, that help students learn more about environmental issues. At the elementary level, Therrien says their goal is to "give kids the basic understanding of the world around them." For environmental issues, students must learn about ecosystems, ecology, water, and how everything interacts. "One thing we don't do," says Therrien, "is overstress kids [at the elementary level] making hard decisions about moral issues and economics. That really starts around fourth, fifth, sixth grade."

At the kindergarten through the third-grade level, the New Haven Public School curriculum gives students an understanding of the world around them and as they get older, they start thinking about issues and positions in the natural world.

To Therrien, environmental education first gets students to understand the natural world, how humans play a part in the environment, and in turn, how the environment affects humans. "We have in our standards a very specific thing about human impacts on the world around them and the other way around- how the world impacts humans. How does climate change, for example, impact humans? How do humans impact climate change?" says Therrien.

He adds that environmental education is also connected to the students themselves, what they care about, and what impacts their life. “About 10 years ago I got frustrated with the state standards because they talked a lot about water pollution, but not about air pollution or climate change. They didn’t talk about soot in the air giving kids asthma, which has been a problem in New Haven,” says Therrien. “Those are the kind of things that we try to make sure to incorporate into our curriculum.

In order to effectively tie environmental education into a curriculum, it’s important to understand how children understand science. Therrien says that children start with understanding the things that are directly connected to them and start to expand their ways of thinking. “I tell teachers that you have to start local and then move out. It’s tough to get a first grader to care about polar bears 20 years from now when they’re having trouble finding clean drinking water.”

The environmental curriculum begins by teaching students about plants and animals in kindergarten. They move on to talking about land, water, and erosion in second and third grade. Third grade, Therrien says, is when students begin learning about weather and climate. This curriculum is designed to begin teaching students about abstract concepts, like climate after they can conceptualize it, which is usually around age eight. “One of the reasons why we wait so long is because to understand weather and climate change, you’re trying to learn abstract things that are not in your view. You can’t see an air mass. You can’t see the wind from the Rockies come down. Those are things the kids can’t directly experience,” says Therrien. Each year, the students learn more about these abstract concepts, until sixth grade, which according to Therrien, is “really all about environmental science” because the students can understand it at that age.

In order for teachers to bring science into their classrooms, they focus on current events and weather, but Therrin says New Haven Public Schools have a specific set of national standards that talk about the human impact in almost every grade, starting in fourth grade and moving up. This ensures that there's something to focus on in each grade. The hard part, Therein notes, is that there is such a wide variety of environmental issues, it's impossible to focus on everything. "There's tons of other issues that we've got to worry about for our students." One of the advantages of the New Haven Public School curriculum is there is a sixth-grade course and a ninth-grade course that focuses almost exclusively on environmental issues, which are required classes for every student.

In the ninth-grade class, students complete a project called "The Energy Forum" where each group has an energy source and they have to imagine they live in a perfect town with a lake for hydropower, a tide for tidal power, and wide fields for solar power. "It's the most idealistic town, so which energy source would you pick? We make it simplistic in order for [the students] to have the debate on the scientific terms equally," says Therrien.

In addition to the ninth-grade project, about 8,000 students from New Haven participate in a city-wide science fair every year. Almost every school sends a project. Therein says that students pick their projects around January and February and about 200 work with mentors at Yale and other businesses. The students do projects at the school level in April. Each school gets about eight or nine spots to send projects to the city fair in May, typically held at Yale Commons. "A good third to one-half of projects are usually about some type of environmental issue."

Because of its focus on science and environmental education, many students who graduate from the New Haven Public School system enter college looking for a career in the STEM field.

Therrien says that New Haven Public Schools has a partnership with the Yale Pathways to Science program. The program tracks students who are going into college. The school system gets data back from the College Clearing House, which tells them how successful students are in college.

According to data compiled by National Student Clearinghouse for 2008-2001, College data for HS class of 2010, 2011, the national average for students graduating from college with a STEM degree was 32% in 2011. That year, the district surpassed the national percentage, and 39% of students from the New Haven Public School district graduated with a STEM degree. "That's really good. It means that we've given our kids the basis for going on in STEM. A lot of our kids stay in the New Haven area where STEM jobs are prevalent," says Therrien.

Currently, New Haven Public Schools are in the middle of finalizing a brand new, three million dollar purchase of an elementary science program, which Therrien says will give New Haven Public Schools "updated elementary materials and curriculum."

Therrien says that in terms of education at the secondary level, environmental education has all of the same issues as general science does. It's happening in schools, but since it's so broad, it's impossible to focus on everything that makes up environmental education. New Haven Public Schools are doing what they can to educate their students as much as possible and get their students interested in science. "It's what the kids want anyway," says Therrien. "When you ask kids why they go into STEM, the biggest thing is not to make money. The biggest thing is 'I want to make a difference in the world.' These kids choose to care about the world that they live in."