Science in Action . . .
Multiage Invasive Species Removal and Replacement

Written by Pam Bergen and Michelle Persichetti, Tremont Elementary School, and Jane Hunt, Upper Arlington High School, Upper Arlington Schools — Upper Arlington, Ohio

“Not that Mrs. Bergen isn’t a great teacher, but it was fun to learn from the high schoolers.” — Andrew, 3rd grader at Tremont Elementary School

The Big Idea

Invasive plant species are nearly everywhere. Approximately 5% of our city, Upper Arlington, Ohio, is wooded, and 90% of our wooded areas have invasive problems. High school students and 3rd grade students partnered together to understand each other and the environment around them, as well as to help remove invasive species from one of our city parks.

Investigation

When Jane Hunt, Upper Arlington High School environmental science teacher, wanted to build literacy confidence in her students, the district literacy leader suggested that she contact us, Tremont Elementary School 3rd grade teachers Pam Bergen and Michelle Persichetti, as potential partners. We realized that we had a common interest in developing real world curricular applications. As educators, we are constantly working to engage our students and to help learning come to life. Elementary students often showcase what they know through project-based learning. Partnering third graders with high school students allowed all of them to be innovative and creative together.

We three teachers worked together to establish goals for the project and brainstorm possible activities. Two important goals of the project were to have rich cross-age, cross-curricular experiences and to contex-
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Rigor, Relevance and Relationships

Service-learning has demonstrated the potential to provide a curriculum that is rich in rigor, relevance and relationships—three elements of learning that play a crucial role in the school improvement process, according to Bill Daggett and his associates at the International Center for Leadership in Education. Consistent with these elements, research clearly shows that students who participate in high quality service-learning experiences become more engaged in learning, more committed to their communities, and more empowered to make positive life and career choices.


Preparation

Initially, in their environmental science class, high school students brainstormed ways to help the community and to engage the 3rd graders in the learning process.

Next, Jane formed the high school students into three action groups (“Get Ready,” “Get Set,” “Go”) based on an interest inventory (shared upon request). Included in the inventory are verb lists that describe the actions associated with each group. Students were familiar with verb lists since they had used them earlier to determine their individual strengths and interests.

The high school “Get Ready” group visited the elementary school to interview 3rd grade classroom teachers about expectations and characteristics of diverse 3rd grade learners.

The “Get Set” group worked on project logistics such as scheduling buses to get to the planting site, notifying the principals, and ordering plants. This group also contacted the Upper Arlington Forestry Department about possible sites and requested instruction on identification of plants. City Forester Steve Cothrel came to talk first with the teachers and then with the students about invasive species and community sites that needed to have invasive species removed. As a result, students better understood the career of a Parks and Forestry employee and the hard work involved in replacing invasive species with new plants.

The “Go” Group documented and shared the project via technology and reflection and made sure the goals of the project were met.

The two elementary teachers established our goals for the project with the 3rd grade students and built anticipation by sharing our enthusiasm for the science study as well as for working with high school students. We talked to our students about respectful behavior toward the older students and anticipated together how we might act when listening or when asked to interact.

Throughout the planning and implementation stages, the three teachers regularly communicated via email and phone or met face-to-face to schedule and develop a tentative agenda for each of the cross-age meetings.

RIGOR . . . Students became empowered to teach their peers and their families. One 3rd grader taught his parents that they should do research before removing plants from their yard. Furthermore, he taught them that if they remove plants, they need to make sure they replant so that the soil doesn’t erode.

--- Michelle Persichetti

“I liked that most kids wanted to read the information aloud . . . kids would fight to read!”

--- Corbin, high school junior on watching the excitement of 3rd graders

Tudorize key common science concepts, including conservation, ecology, human-environmental interaction, plants and soil.
High school environmental science students “invaded” a 3rd grade classroom to determine what 3rd graders know about plants and the environment. The students interviewed the elementary teachers about 3rd grade learning styles, use of 3rd grade jargon, effective ways to peak interest, and how best to discover the younger students’ prior knowledge base.

Once informed, the science class developed their project introduction activity to excite and inform the 3rd graders. The two classes of 3rd graders also learned by investigating invasive species via classroom animal/plant “stations.”

Working in groups, two 3rd graders and a high school student (three students per collaborative team) then developed a variety of literary teaching tools including raps, plays, poetry, skits, dioramas, puppet shows, paper engineering, PowerPoint presentations, and Garageband songs. Topics included plant personification, problems posed by invasive species, what can be done to eradicate them, and environmental tips. The teachers provided supplies and a brainstorming sheet for the creation of the learning presentations.

Next, the cross-age groups taught the other two 3rd grade classes at Tremont Elementary School during a two-hour Invasive Species Open House held during the school day. At the end of the event, the collaborative teams reflected to assess the effectiveness of their efforts.

As a culminating experience for our cross-age study, the high school environmental science students and all of the 3rd graders traveled to Fancyburg Park in Upper Arlington to remove invasive species in a section of the 2 ½ acre park. They worked in six groups of ten 3rd graders and six high schoolers each. Student groups rotated through six stations—Litter Pick-Up, Art Reflection, Scavenger Hunt, GPS Treasure Hunt, Removing Invasives, and Planting Natives. After they visited the stations, elementary and high school students met to reflect on their new information and the work they were doing.

Finally, the cross-age groups worked together to remove invasive plant species and replace them with native plants so that the native species can once again flourish in the park.

When this project began, students were unsure of what to expect. They were pleasantly surprised at the ease with which they communicated and bonded. Having met various times throughout the year, students

**RELEVANCE . . .** They really didn’t have a clue how big a problem invasive species are here in our own backyards. One high school student had a conversation with an adult to that effect when he saw the photo of honeysuckle and looked around at the park—Student: “We are supposed to remove that? But that’s everywhere!” Teacher, Jane Hunt: “That’s why they call it invasive!”
K-12 Service-Learning Standards for Quality Practice

Meaningful Service: Service-learning actively engages participants in meaningful and personally relevant service.

Link to Curriculum: Service-learning is intentionally used as an instructional strategy to meet learning goals and/or content standards.

Reflection: Service-learning incorporates multiple challenging reflection activities that are ongoing and that prompt deep thinking and analysis about oneself and one’s relationship to society.

Diversity: Service-learning promotes understanding of diversity and mutual respect among all participants.

Youth Voice: Service-learning provides youth with a strong voice in planning, implementing and evaluating service-learning experiences with guidance from adults.

Partnerships: Service-learning partnerships are collaborative, mutually beneficial and address community needs.

Progress Monitoring: Service-learning engages participants in an ongoing process to assess the quality of implementation and progress toward meeting specified goals, and uses results for improvement and sustainability.

Duration and Intensity: Service-learning has sufficient duration and intensity to address community needs and meet specified outcomes.

Source: National Youth Leadership Council (www.nylc.org)

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had developed an ongoing emotional relationship with their buddies. As a result, their work day was a great success.

Reflection

Students reflected during and after each session, both discussing and writing together. They charted the best parts and the worst parts of the project as well as their wishes for future projects. They also painted watercolors and participated in a variety of discussions and presentations.

Celebration/Demonstration

Students shared a celebratory lunch together in the park. It was fun to see the high school students giving the students piggyback rides and playing with them on the playground equipment.

Third grade students demonstrated their new learning by documenting the big ideas that they wanted to communicate and teach to other classrooms. Based on that pre-planning, they formulated their student-led lessons and extended their own learning and became teachers to their peers.

Assessment/Evaluation

“I thought teenagers just listened to loud music in their car and were kind of mean. This really showed me they are fun!”

— Ruth, 3rd grader

Factual knowledge about invasive species was documented through informational student-led lessons. These lessons allowed the students to share their new knowledge with others. In addition, the teachers were able to determine the accuracy of information and depth of learning in their students’ lessons.

Other 3rd grade classrooms and high school students were asked to document what they learned about the project and about young people of other ages.

Video interviews show how students were impacted by the inaugural project.

Curriculum Connections/Standards

Art: visual—reflective watercolors; performing arts—teaching skits, poems, and lessons

Language Arts: communication; research skills; literacy

Science: soil; plants; human/environment interaction; ecology

Social Studies: role of government; citizenship; rights and responsibilities
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21st Century Skills

The Partnership for 21st Century Skills has identified the elements described in the sidebar on the right as the critical systems necessary to ensure 21st century readiness for every student. Though the Science in Action service-learning project clearly demonstrates connections to many of the skills, the following outlines one skill in detail.

Impact: Kids Using Their “Best Stuff” to Make A Difference

Some of the most reluctant learners became leaders and showcased leadership skills. Other students who had typically been unenthusiastic learners became important and integral parts of the effort.

When students chose what they would present for the teaching lesson, they demonstrated their unique gifts, passions, and strength of character through their differentiated projects. For example, because of her love of photography, high school student Tori made sure that 3rd graders in her group captured the events with cameras.

Students became empowered to teach their peers and their families. One 3rd grader taught his parents that they should do research before removing plants from their yard. Furthermore, he taught them that if they remove plants, they need to make sure they replant so that the soil doesn’t erode.

Relationships were of key importance in this project. Stereotypes and misconceptions were eliminated through the interactions with their buddies, and both ages of students developed strong bonds with their buddies. Many exchanged phone numbers and email addresses to continue their friendships.

There is now a new sense of community between these two age groups and schools. Students from Tremont were proud to share their community garden project with their high school buddies.

ICT (Information, Communications, and Technology) Literacy: Some students used GarageBand to tap into their talents, gifts, and fascinations to teach others about invasive species. Other students used PowerPoint, Flip Mini video, digital cameras, and Global Positioning Systems.


21st Century Skills addressed and demonstrated by the Science in Action service-learning project:

- Global Awareness
- Financial, Economic, Business, and Entrepreneurial Literacy
- Civic Literacy
- Health Literacy
- Creativity and Innovation
- Critical Thinking and Problem Solving
- Information Literacy
- Media Literacy
- ICT (Information, Communications, and Technology) Literacy
- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

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Next Steps/Call to Action

We’d like to think the project changed the elementary children by opening their eyes to unique partnerships. It would be neat to see them using self-direction skills that would lead to their suggesting a future pairing with a different age group of learners—it worked once, it could be done again.

The high school students that had worked with children before were validated by taking on several buddies and helping them understand the concepts. One girl worked effectively with four little boys who were pretty rambunctious, and they took many of the photos for the last day. She knows she can work successfully with younger children.

From our perspective as teachers, we are excited to do the project next year. We would add some new elements to our project:

- Interview students prior to the beginning of the project to find out what they think it will be like to meet and work with another age group (determine pre-conceptions and stereotypes);
- Allow more time for students to take on leadership in setting up, planning meetings, activities, and events including logistics;
- Start earlier in the year;
- Raise money to buy native plants with students leading the effort;
- Publicity—submit articles to local newspapers, present to City Council, Rotary Club, and other community organizations;
- Use Skype as a communication tool;
- Have kids journal throughout;
- Collect all student work such as reflections, planning steps;
- Be more specific to ask what students learned—about themselves, new skills, how they contributed, how they could contribute more;
- Create posters for display at the Municipal Building;
- Train the community about the problem of invasive species;
- Teach literature circles format for nonfiction book groups; and
- Do more writing about invasive species.

Other Insights . . . Reflections of the Teacher

We like that the students had a common goal. We had the perception that they weren’t very together, but they all came together so well—maybe not the way we as adults perceived it should be, but they pulled through and made it their own. The quality of the reflection was amazing. Even though sometimes it looked and felt like chaos, it was really incredible, impactful learning! We can’t wait to partner again!
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Students will be able to visit this local park and watch the progress of native plant growth and be more aware of the presence of invasive species. This was authentic learning that helped young people apply their new knowledge. As 3rd grader Jackson said during a different service-learning project, “Do you mean cancer invades your body like the invasive plants invade the environment?”

“...You should take that Environmental Class at the high school next year so that you can do this invasive project. Pulling weeds and our big buddies were totally awesome!”

— Andrew, 3rd grader, to his older high school brother

The Science in Action
Multiage Invasive Species Removal and Replacement Service-Learning Project Contact Info

Names: Pam Bergen, Michelle Persichetti and Jane Hunt

Positions: 3rd grade teachers (Bergen and Persichetti)
High School Environmental Science Teacher (Hunt)

Schools: Tremont Elementary School
Upper Arlington High School

School District: Upper Arlington Schools

School Address:
Tremont Elementary School
2900 Tremont Road
Upper Arlington, OH 43221

Upper Arlington High School
1650 Ridgeview Road
Upper Arlington, OH 43221

School Phone:
614.487.5170 (Tremont)
614.487.5200 (UAHS)

Email:
pbergen@uaschools.org
mpersichetti@uaschools.org
jhunt@uaschools.org
What Ideas Can You Add?

For more information, contact:

Ellen Erlanger
Kathy Meyer
The Legacy Group,
Partnerships Make A Difference
1601 W. Fifth Ave., #106
Columbus, Ohio 43212
(P) 614.488.3459
(F) 614.488.1864
info@partnershipsmakeadifference.org
partnershipsmakeadifference.org

Charlotte Jones-Ward
Ohio Department of Education
Learn and Serve Ohio
25 South Front Street, MS403
Columbus, Ohio 43215
(P) 614.466.8920
(F) 614.387.0963
Charlotte.jones-ward@ode.state.oh.us
learnandserveohio.org