



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

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“ 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

What?

A few fast facts . . .

- ▶ Students and teachers wanted to learn about invasive species while improving a city park
- ▶ 96 third-graders and 58 high school juniors and seniors
- ▶ Teachers: Jane Hunt, Pam Pergen and Michelle Persichetti
- ▶ Curriculum Area(s): Science, Art, Social Studies and Language Arts
- ▶ Community Partner: Steve Cothrell, Upper Arlington Parks and Forestry

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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 **context-**

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.

International Center for Leadership in Education, www.leadered.com

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tualize key common science concepts, including conservation, ecology, human- environmental interaction, plants and soil. ▶

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

“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

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

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

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. ▶

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Action

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

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!”*

were pleasantly surprised at the ease with which they communicated and bonded. Having met various times throughout the year, students

A typical service-learning project includes five components:

Investigation: Teachers and students investigate the community/world problems that they might potentially address. Investigation typically involves some sort of research and mapping activity.

Planning and Preparation: Teachers, students, and community members plan the learning and service activities, and address the administrative issues needed for a successful project.

Action: The “heart” of the project . . . engaging in the meaningful service experience that will help students develop important knowledge, skills, and attitudes, and will benefit the community.

Reflection: Activities that help students understand the service-learning experience and think about its meaning and connection to them, their society, and what they have learned in school.

Demonstration/Celebration: The final experience when students, community participants and others publicly share what they have learned, celebrate the results of the service-learning project, and look ahead to the future.

Assessment is part of all activities to ensure that the learning and development that occur through service-learning can be measured, and to help diagnose student needs, provide feedback, and improve instruction.

K-12 Service-Learning Project Planning Toolkit. Created by RMC Research Corporation for Learn and Serve America's National Service-Learning Clearinghouse

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

Social Studies: role of government; citizenship; rights and responsibilities

Language Arts: communication; research skills; literacy

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

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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.

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*. ▶

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

Relationships . . . *My kids are much more likely now to want to talk with and work with 3rd graders . . . there were some that were asked to babysit and visit them at the pool this summer. Before the project, the high school students had absolutely no interest or curiosity about younger kids . . . they mostly just thought they were annoying.*

-- Jane Hunt

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. ▶

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

Source: *The Partnership for 21st Century Skills* (www.p21.org)

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So What?

Results and impact . . .

- ▶ 1,540 service and learning hours contributed
- ▶ Removed and replaced invasive species in local park

Now What?

A Call to Action:

Now that you have read about these teachers' students and their efforts to help with "Science in Action," what could you and your students do to make a difference? Just like Pam, Michelle, Jane and their kids, there are many environmental issues to be solved. Let us know what you and others in your community are doing by posting your information on . . . partnershipsmakeadifference.org

To learn more about how to help with an environmental issue like invasive species, log on to . . .

The Ohio Invasive Plant Council
www.oipc.info

In addition, you may find these sites helpful:

Ohio Department of Natural Resources
www.dnr.state.oh.us
U.S. Environmental Protection Agency
www.epa.gov

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

"I hope that this cements the idea that fellow students can be experts and teach others new concepts and ideas."

-- Pam Bergen

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 Replace- ment Service-Learning Project Contact Info

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What Ideas Can You Add?

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