Grade K Science

1) Introduction: Service-learning is an excellent way to teach Science. Service-learning emphasizes a "hands-on" experiential approach as a means of connecting academic learning to real-world applications. This approach is an effective way of engaging students in scientific concepts, which can sometimes seem abstract. Service-learning brings students into direct contact with real-world community problem-solving and by framing the scientific method as a problem-solving tool itself, students can begin to see the impact science has on the world around us.

2) Definition of service-learning:
Service-learning is a form of teaching and learning that engages students in meaningful service activities in their schools and communities as part of the standard academic curriculum. Integrated into (but not limited to) the school day, service-learning connects young people with structured activities that address human and community issues, and that provide opportunities for increased student academic engagement, civic responsibility, personal and social development and the acquisition of critical thinking skills.

The following concepts are central to good service-learning practice. Evidence of these elements as well as their alignment with Pennsylvania state standards and the School District's promotion/graduation requirements are keys to model practices.

- **Student voice in choosing, developing and implementing a project:** Service-learning works best when students are involved in something relevant and meaningful to them. Encourage student participation and sharing of responsibility in all aspects of a project.

- **Identification of genuine need:** The "community" identifying the need can be the class, the school, the neighborhood, a community partner, the city, etc. Goals for addressing problem have the support of designated community and clearly defined objectives.

- **Mutual benefit for students and community partner(s):** Students acquire knowledge and skills, and in return contribute a short or long-term solution to the problem. Sensitivity to needs and/or limitations of all parties is important.

- **Sustained student involvement:** Length of project can vary but should span a minimum of 6 weeks. Projects with greater richness and complexity may last a semester or an entire school year.

- **Rigorous, multidisciplinary research:** Projects should meet content standards in at least two academic disciplines and demonstrate writing and research competence. Research can explore root causes/effects, potential solutions or public policy related to the problem.

- **Ongoing reflection:** Reflection activities should occur throughout the project. They reveal cognitive and affective learning and can incorporate speaking, writing and/or multimedia strategies.

- **Assessment of student learning and project impact:** Evaluates academic, personal and social development as well as whether stated community need has been

met/addressed. Rubrics and other authentic assessment tools are preferred.

- **Culminating presentation:** Presentations or exhibitions of learning allow students to demonstrate what they have learned for the benefit of others, including community partners. This may occur through oral presentations, culminating events, and/or artistic expressions.

- **Final celebration:** Positive change and collaboration is hard work! Acknowledge and celebrate the contributions and accomplishments of all who were involved.

3) Sample Project Description
A sample project description is included for your convenience. This particular project is not required, however, it is designed to fit the core curriculum for this subject and it reflects a common issue or problem in many of Philadelphia's communities. Teachers are encouraged to transform this project and take it in new directions.

Trees in the schoolyard
This project has students surveying the trees near their school, describing their characteristics (3.2.4 B) and then planting seedlings for use on school grounds or for donation to another neighborhood site. This project will reinforce the academic content of the "Trees & Our Senses" unit during the first twelve weeks of the school year.

Students should be given time to decide which types of trees they want to grow and how they want them to be used. Contact the Pennsylvania Horticultural Society (see Section 8 below) to discuss which types of trees are most suitable. For example, the students may want to plant trees to add to school grounds, and may choose the same species already planted there. They may identify a local park or senior center where they would like the trees to be planted. Alternatively, their survey of trees on the school grounds may find that some are damaged or need tending. Instead of growing new trees, they may choose to care for existing ones, such as by putting a fence around them. Or they may do all of the above.

A key piece of service-learning, especially for younger grades, is celebration and recognition.

4) Sample Lessons/Activities

- Discuss the properties of trees and how they are different from other plants (3.3.4 A)
- Describe characteristics of trees near the school using the five senses (3.2.4 B, 4.7.4 A)
- Describe the needs of trees and see if they are being met on the school grounds (3.3.4 A)
- Identify the differences between different types of trees on the school grounds (4.7.4 A)

5) Sample Rubric

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Rubrics can be used at all steps of the service-learning process. Each activity can have its own rubric, and you can use a cumulative rubric to assess student work at the end of the project. Here are two sample rubrics that assess student learning, one on developmental growth and one on task completion.

See attached

6) Multidisciplinary Connections
Social studies – Make a map of trees in the community
Math – Count the number of trees on the school grounds
English – Have students write basic descriptions of the trees near school
Art – Use different media to illustrate the different trees found near school

7) For more information:

National Arbor Day Foundation: Youth Education
http://www.arborday.org/kids/teachingYouth.cfm

American Forests: Resources for Kids
http://www.americanforests.org/resources/kids/

Illinois Department of Natural Resources: Kids for Trees
http://www.inhs.uiuc.edu/chf/pub/tree_kit/

8) Local resources:
Pennsylvania Horticultural Society: Tree Tenders Program
http://www.pennsylvaniahorticulturalsociety.org/phlgreen/treetenders.html

TreeVitalize
http://www.treevitalize.net/

Urban Tree Connection
Skip Weiner
215-877-7203

Awbury Arboretum
http://www.awbury.org/

Morris Arboretum
http://www.business-services.upenn.edu/arboretum/