

# 10<sup>th</sup> Grade: Biology

**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 key 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 goals.
- **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 8 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

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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.
- **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.

**Blood Drive & Community Health Fair:** Despite new technologies and new medications constantly debuting, Americans are not necessarily getting healthier. In Philadelphia, persistent health problems continue to impinge on our quality of life. In this project, students will research and address health problems specific to their community (3.2.10, 3.8.10 B). Their "community" may be interpreted as their age group, their ethnic/racial community, and/or their geographic neighborhood.

At this level, biology can be taught almost exclusively through the lens of human biological processes (3.1.10 A). It is suggested that your students plan a blood drive to take place to complement learning about Cell Structure & Function (3.3.10 B). Students can also plan a health fair for their peers, parents, and fellow community members.

In this project, students may want to work with a local health and neighborhood organizations to identify a particular health topic. Students should research the topic as well as design some type of intervention (3.2.10). Their presentation at the health fair itself might be a form of intervention (i.e. education); however, they may choose to do something else as well such as create nutrition activities for younger children (3.1.10 A), design and implement a regular community fitness night at the school, or create a school-based fruit stand to improve nutrition. Students may work on projects individually, or in groups. The health fair can be the main expression of student work, or it can be a culminating event for semester full of other activities.

## 4) Suggested Lessons/Activities:

### Situating Students in the Problem

- What makes someone healthy? How does our environment affect our health? What types of problems affect young people? Older people? People in our community? (3.3.10)
- Watch *Supersize Me*, documentary about a man who spends an entire month eating McDonald's and subsequently experiences health problems. Good companion book: *Fast Food Nation* by Eric Schlosser.

### Research

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- How does obesity affect the body? How does it affect cells?
- What causes obesity? How has technological change affected obesity rates over time?
- Does our community have access to healthy foods? How does it compare to other neighborhoods?

## Creating a Solution

- This will be specific to the type of health problem your students identify. Suggestions are: creating a campaign to reduce consumption of fast food, starting a support group at school for parents, teachers, community members, and/or students to encourage healthier eating, starting a fitness night at school, etc.
- Students should be encouraged to use technology to communicate information (3.7.10 D)

## Assessment

- Involve students in determining if their intervention is successful.

## 5) Sample Rubric

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 is a sample rubric that covers a scientific drawing of a cancerous cell compared with a healthy cell. This rubric was created on Rubistar, a free web-based program which can be found at <http://rubistar.4teachers.org>.

See attached

## 6) Multidisciplinary Connections

Math – calculations of the full cost of a particular health problem such as obesity  
College & Careers – visit weight loss centers and/or college nutrition education program  
Literacy – Read Eric Schlosser’s *Fast Food Nation*

## 7) Where to get more info?

American Obesity Association: <http://www.obesity.org/>  
Centers for Disease Controls Obesity Website:  
<http://www.cdc.gov/nccdphp/dnpa/obesity/>

## 8) Local Partners:

Urban Nutrition Initiative: <http://www.urbannutrition.org/>  
American Red Cross: <http://www.redcross-philly.org/>  
Local hospitals, doctors, and other health professionals  
Philadelphia Department of Public Health:  
<http://www.phila.gov/health/units/ahs/hcc/index.html>  
Philadelphia Health Management Corporation: <http://www.phmc.org/>

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This curriculum insert was developed by Hillary Aisenstein, Director of the Philadelphia Higher Education Network for Neighborhood Development (PHENND), as part of a collaborative effort between the School District of Philadelphia and several local community-based service-learning organizations, designed to integrate service-learning with the new core curriculum.