

# ADOPT-A-BEACH

Primary Content Area: Algebra I

## Introduction

Many of the beaches in Chicago are dirty and in the need some loving care. This is a great project for students to realize the harm that litter causes to environment. Many students will be amazed at the amount of trash that is collected. Working in partnership with the Alliance for the Great Lakes, this project is fun and easy to complete. When you are filling out the forms the Alliance for the Great Lakes needs, you have collected data that is great to incorporate into your classroom. Here is the project that has been used successfully in CPS high school classrooms.

## Project Goals

- Students will use data and statistics to help support arguments.
- Students will learn to use the appropriate graphs to represent data.
- Students will learn how to calculate and put together a budget.
- Students will understand the need for cleaner beaches.
- Students will understand the role that citizens and civic organizations can play in conserving Lake Michigan as a vital resource.
- Students will reflect upon their experiences.

## Procedure/Project Sequence

1. Contact the Alliance for the Great Lakes to identify and set up beach to adopt.
2. It is a really good idea to attend one of the trainings that the Alliance for the Great Lakes holds. It will help you get a better idea of what you need to do at the beach.
3. You can take the students as a field trip or as a Saturday project.
4. Explain the whole project beforehand to the students. Let them know that everyone will use the data and complete the reflection portion in class for a grade. Students will only receive the service-learning hours if they attend the beach clean-up. This gets many students to sign up. The field trip can get all of your students to go, but logistically becomes harder with getting a bus, a sub for yourself. Check with your Service-Learning Coach about getting funds for the bus and substitute.
5. When at the beach, the Alliance staff will give you all the forms you need to complete the data collection process. These forms when completed will also give you the data you need to complete this project.
6. Organize your students into groups and look at the totals of each trash item collected and see which three trash items had the greatest frequency. Students select once of these trash items to use for the project.
7. Students research what harm this trash item can do to the beach. They may have to think creatively here. For example, instead of researching caps and lids pollution, have them search plastic pollution. Similarly, instead of just researching cigarette butts, have students research what chemicals are in cigarettes and what harm they can do to the beach.
8. Next they need to graph the totals from each trash item collected. Also have them graph the trash item collected at your beach versus other beaches around Lake Michigan to get a comparison. You can find this data from the Alliance for the Great Lakes website.
9. Have the students come up with a plan to improve the beach. The more detailed the plan the better. Steer them away from just adding more trash cans and recycling bins.

10. Next students should calculate the cost of their plan. They can use the internet to research the cost of things they are using for the beach. Make sure they are identifying anything in their project that can cost money (labor, materials, signage).
11. Have student groups research potential grants that help cover the cost of the plan.
12. After having all this information they now can put together a letter explaining the problem, a solution, and a cost of the solution. They should use data to help write the letter. You should send this letter to the appropriate official who can help bring positive change to the lakefront. Identify congressmen, state and federal, mayor, or park district superintendent.
13. Now they put together a power point presentation going into further detail about what they wrote in the letter. The presentation would be one they would give if the person receiving the letter wanted to hear more about their ideas to help keep the beach clean

### **Community Partners/Resources**

Alliance for the Great Lakes  
 17 North State Street, Suite 1390  
 Chicago, IL 60602  
 Phone: 312/939-0838  
[www.greatlakes.org/adopt](http://www.greatlakes.org/adopt)

Worksheets are available to help students complete the steps of this process. Feel free to email Keith Scherdt at: [kwscherdt@cps.k12.il.us](mailto:kwscherdt@cps.k12.il.us).

### **Addendum**

*Standards:* This project addresses the following Illinois Learning Standards for Mathematics:

- 6.B.4: Select and use appropriate arithmetic operations in practical situations including calculating wages after taxes, developing a budget and balancing a checkbook.
- 6.C.4: Determine whether exact values or approximations are appropriate (e.g., bid a job, determine gas mileage for a trip).
- 6.D.4: Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.
- 8.B.4a: Represent algebraic concepts with physical materials, words, diagrams, tables, graphs, equations and inequalities and use appropriate technology.
- 10.A.4a: Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatter plots and box-plots.
- 10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology
- 10.B.4 Design and execute surveys or experiments, gather data to answer relevant questions, and communicate results and conclusions to an audience using traditional methods and contemporary technology.
- 10.B.5 Design a statistical experiment to answer a question about a realistic situation, conduct the experiment, use statistics to interpret the data, and communicate the results, individually and as members of a team.

*Hours Recommendation:* Students who complete the entire project should be awarded between 10-20 hours depending on the amount of time spent at the “adopted” beach. The Alliance of the Great Lakes encourages adopting groups to make 2-3 visits to their beach each year. Hours can be broken down into the following categories:

Preparation: Learning graphing and data management skills – 2-3 hours  
Action: Beach clean up and data gathering – 3-12 hours  
Reflection: Exploring potential beach maintenance strategies – 2-4 hours