

Math Classes for Treatment Plant Operators

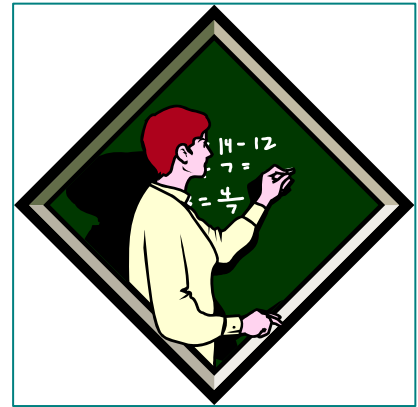
Introduction

Sometimes, operators of small-town wastewater treatment plants have difficulty passing the higher level operators' exams. The operators understand the plant processes but lack the necessary mathematics knowledge to pass the tests. Recognizing this problem, Washington State Department of Ecology (Ecology) facilities managers designed and taught classes to help the small-town operators improve their math skills in order to pass the exams.

Problem

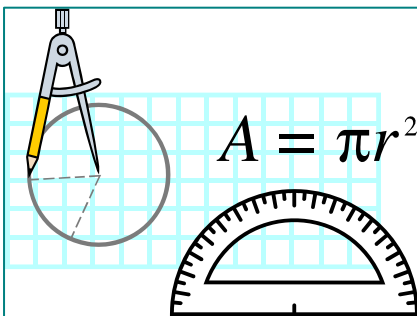
Wastewater operators who lack basic math and geometry skills to pass the certification exam often live in small towns with small budgets, many miles away from where math courses are taught.

Jean Hays discovered this problem at some of her facilities located in small towns in central Washington. Budget limitations and distance often prevented operators from attending formal classes to improve their math skills. So, Jean came up with a plan. She asked her co-worker, Lynda Jamison, if she would be interested in holding math classes in some of these small towns. Luckily, Lynda had experience teaching college level business math, algebra, and accounting courses before coming to work for Ecology. Lynda agreed to hold the classes for an hour and a half, twice a week. Jean would arrange for a classroom and provide refreshments for the operators.



Project outline

The classes began in December 2007. Lynda started with basic math skills and understanding the relationships between numbers, such as the basics of multiplication, division, and fractions. Then the class moved on to understanding decimals, solving basic algebraic equations, and learning to determine portion, base, and rate. Finally, they tackled some of the most common problems found on wastewater exams using common formulas and conversion factors.



The teachers found practice worksheets on websites such as A-Plus Math and Math Is Fun. Lynda drew on her past teaching experience to create handouts of lecture notes and diagrams to help students complete their worksheets. The class practiced solving problems during class time and took worksheets home with them to solve on their own. Each day, the class would go over the answers to the previous day's worksheets. Then Lynda worked with the class on some of the more difficult problems and explained each step. Soon the operators were able to tackle even the most challenging math story problems.

Project highlights

The operators learned quickly and seemed to enjoy the challenge of the algebra and geometry portions. They also became excited about being able to figure out portion, base, and rate. They realized the importance of learning all these steps to prepare them to use the formulas required for the wastewater exams.



Milestones and outcomes

By the time the students worked on the real-life wastewater problems, they better understood mathematical functions and were able to solve these more difficult problems with ease. Knowing that they could solve the problems they would be facing on the exams gave the operators more confidence.

One of the points Lynda stressed to students was that anyone can do math. It is just a matter of practice. Just like learning to dance or bowl or play football, some people need more practice than others do. But the more you practice anything, the better you get at doing it.

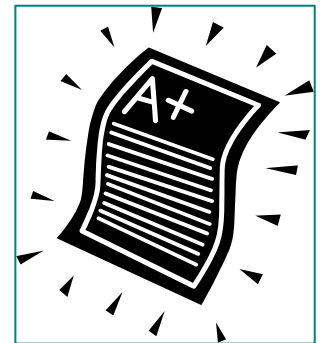
Lynda ended the math course with a handout of website addresses where the operators can practice solving sample wastewater problems.

Partners

The partners included two Ecology facilities managers, Lynda Jamison and Jean Hayes, and the operators of numerous wastewater treatment plants. Other key players were the supervisors who promoted these educational sessions, including the city officials in the small towns where the lessons were held, and CRO/WQ supervisors Denise Mills and Rick Frye.

Funding

No special funding was necessary for this project. The only expenses incurred were for Lynda's time, the copies of worksheets and handouts, and use of a state vehicle to drive to the site.



For more information

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