How Much Mulch?

Activity Overview
Students research prices of various mulching techniques, calculate the cost for each method on their restoration and, based on cost as well as other factors, make a final mulching recommendation.

Objectives
Students will:

- Measure and calculate area and volume in real world context
- Determine measurement using conversion of units, geometric formulas, scale drawings and estimation
- Calculate cost of complex project using arithmetic skills and estimation
- Compile, organize and evaluate information and make recommendations based on all information

Subjects Covered
Math

Grades
6 through 12

Activity Time
Measuring the site: 45 minutes.
Price research: 30 minutes.
Calculating costs: 45 minutes - 1 hour.

Season
Any

Materials
Measuring tapes, calculators, phone book, phone

State Standards
Math:
Develop effective oral & written presentations (A.8.4, A.12.4)
Perform & explain operations on rational numbers (B.8.2)

Background

Mulching is a common method used to eliminate established perennial or annual weeds on a proposed restoration site. The basic idea behind mulching is that by covering a site with a material that blocks all light, weed growth stops and the plants die. In some cases, mulching may diminish the seed bank as well. In this way, the site is "cleansed" of weeds that are growing and possibly weed seeds that would otherwise germinate and grow in the newly planted site.

Mulching is an effective, safe technique that provides opportunities for student involvement. Let the students do the footwork necessary to decide which mulching system to use and how much mulch to use. It gives them some real life applications for basic math skills and is necessary before proceeding with the restoration effort.

Three common methods of mulching include the use of landscaping cloth, black plastic or newspaper. Landscaping cloth is likely the most expensive initially but it is very effective and can be used for several years. Newspaper is very inexpensive, is not quite as effective, and may or may not last the full year necessary before degrading. Black plastic is often moderately priced and, can be used for one year and can become unsightly. An uncommon yet surprisingly successful method is used carpeting with the backing side up. It can be used for more than a year.

The surface material must be weighed down for the entire year of treatment to ensure the dark conditions necessary for eliminating the plants (weeds). For a school prairie, weighing down your mulch layer with wood chips is a good option. Wood chips are inexpensive (often you can acquire them for free—call around before you purchase chips), aesthetic, safe and can be placed by kids. When the mulch is taken up, wood chips can be raked directly onto a line designated for the path through the restoration.

But which mulch to use? How much will they cost? How much do you need? Put your students on the trail of this and let them plan it out.

Activity Description

As a class, measure the restoration site and draw a sketch of it onto your data sheet. On your sketch, indicate the dimensions. Based on your measurements, calculate the size of your restoration site. The size should be in square feet.

Divide into three groups. Each group will do research on a different type of mulch—landscape cloth, black plastic and wood chips. Using a phone book, identify local sources for your mulch type. In the case of woodchips, consider your local city or municipal road crew who often chip trees that they must remove. Divide up the contacts and call each to determine the cost

Use appropriate computational procedures with rational numbers (B.8.7)

Perform & explain operations on real numbers (B.12.3)

Determine measurement directly by using standard units (D.8.3)

Determine measurement indirectly (D.8.4)

Determine measurement indirectly (D.12.3)

Science:

Explain data & conclusions (C.8.7)

Evaluate data (C.12.3)

Present results (C.12.6)

of your mulch and how it is sold (rolls, sheets or cubic feet). If it is sold as a roll or sheet be sure to find out the dimensions or square footage of a roll or sheet.

Report the best prices to the entire class so that everyone is using the same numbers in calculating cost for the restoration. Considering all pros and cons of each method, make your recommendation as to which mulch the school should use.

Extensions

- Research alternative methods for removing existing vegetation such as using a sod cutter or herbicides.
- Find out what techniques community members with existing native plantings used and what you might learn from their experiences.

Additional Resources

- Packard, Stephen & Cornelia F. Mutel (Eds.). (1997). *The tallgrass restoration handbook: For prairies, savannas, and woodlands.* Washington, D.C.: Island Press.
- Thompson, Janette R. (1992). *Prairies, forests, and wetlands: The restoration of natural landscape communities in Iowa.* Iowa City: University of Iowa Press.
- Shirley, Shirley. (1994). *Restoring the tallgrass prairie: An illustrated manual for Iowa and the upper Midwest*. Iowa City: University of Iowa Press.
- Murray, Molly F. (1993). *Prairie Restoration for Wisconsin Schools: A guide to restoration from site analysis to management.* Madison: University of Wisconsin Arboretum.

Assessments

- Research skills are thorough and calculations are accurate.
- Information is compiled neatly and is well organized.
- Recommendations for which mulch method to used is based on logical thinking.

How Much Mulch? Student Worksheet

1. Calculate square footage in restoration. Draw a sketch of the shape of the site, including dimensions.

2. Landscape Cloth

   Cost _____ per _____

   Number of square feet in restoration _____

   Calculate amount of landscape cloth needed:

   Cost of landscape cloth for restoration _____

3. Black Plastic

   Cost _____ per _____

   Number of square feet in restoration _____

   Calculate amount of black plastic needed:

   Cost of landscape cloth for restoration _____

How Much Mulch? Student Worksheet

4. Newspaper

(8 sheet thickness needed)

Area of 1 sheet newspaper _____

Number of square feet in restoration _____

Calculate number of sheets of newspaper needed:

(Remember to include some overlap of the newspaper sheets)

Calculate approximate number of newspapers needed:

(approximately X sheets of newspaper in daily paper)

5. Wood Chips

Cost _____ per _____

Number of square feet in restoration _____

Calculate volume of wood chips needed:

Wood chips should be approximately 3" deep.

1 cubic yard = a cube 3 x 3 x 3 feet = 27 cubic feet

Cost of wood chips for restoration _____