
How Much Seed Do I Need?

Activity Overview

Students measure and calculate restoration site's area and calculate quantity of seed needed.

Objectives

Students will:

- Add, subtract and multiply whole and decimal numbers to solve a real world problem
- Measure length, perimeter and calculate area
- Construct accurate map from direct measurement

Subjects Covered

Math

Grades

3 through 12

Activity Time

Two hours to measure and calculate restoration site's area; 30-60 minutes for seed calculations.

Season

Any

Materials

Tape measure and graph paper to calculate restoration site's area; calculator for seed calculations.

State Standards

Math:

Communicate mathematical ideas (A.4.2), logical arguments (A.8.2, A.12.2)

Recognize & describe measurable attributes & units (D.4.1)

Demonstrate understanding of measurement (D.4.2, D.8.2, D.12.2)

Read & interpret measuring instruments (D.4.3)

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

Select & use tools to determine measurements directly (D.12.2)

Background

By this point in the restoration process, students have already performed a site analysis to determine what ecosystem to restore, and have decided which species to include (Earth Partnership for Schools activity, "Prairie Garden Species Selection"). The next step is to calculate how much total seed is needed. This activity focuses on this step.

Prairie restorations can be planted with seeds, transplants or a combination of both. If you are planting with seedlings or transplants, figure one plant per square foot. There need not be exactly one plant in each square foot, but use your total area to figure the number of plants you need. If planting with seeds, target a seeding rate of 40-60 seeds per square foot. This is roughly equivalent to 20 pounds of seed per acre or .0073 ounces of seed per square foot. (Somewhat lower rates are sometimes used to make the planting more economical, however, we feel that 20 pounds per acre is ideal).

If using a combination of transplants and seeds you need to first determine how many transplants you wish to include. Seed quantity is then calculated based on the original square footage minus the square footage covered by transplants that you intend to use. For example, if you plan to plant 400 transplants into a 1,000 square foot prairie, the transplants account for 400 square feet (at a rate of one plant per square foot). Hence, seed should be calculated based on a 600 square foot plot.

Try to plant 50% grass seed and 50% forb seed, by weight. Include at least 3-5 grass species and 20-40 forb species. Remember that all these numbers are only guidelines. Individual plantings will vary.

After considering how much total seed is needed, students will need to decide how much seed of each species to order in the Earth Partnership for Schools activity, "Balancing the Budget".

Activity Description

In order to calculate how much seed is needed for your prairie restoration, you need to know the area of the proposed planting. If you do not know this, grab a tape measure and measure the site. If it is not a regular shape, you may need to be creative to calculate the area. Divide the area into smaller triangles, squares or rectangles, calculate the area in each shape and add them together. Alternatively, the perimeter can be precisely mapped on a piece of graph paper using a simple scale such as one square equals one foot. After mapping the perimeter carefully, count the squares in the interior. Calculate the area in a square and multiply the number of squares by the area of each square.

How Much Seed Do I Need? (cont.)

The other piece of information you need to know is how many transplants, if any, are going to be planted into the restoration. After that you are ready to calculate the total seed needed for your restoration. The worksheet, (How Much Seed Do I Need) will walk you through the process. The calculations are based on a guideline of 40-60 seeds per square foot and 20 lbs. of seed per acre (or .00735 ounces of seed per square foot).

Extensions

- Determine the amount of seed needed to restore alternative sites on the school grounds.
- Using maps, determine the amount of seed needed to restore part of a local park or some other area.
- If you have permission, collect some seed from another prairie. Determine the percentage, by weight, of seed collected to total material collected. Conduct tests to determine the percentage of seeds that germinate (see Earth Partnership for Schools activity “Germination Determination”). Multiply these two percentages together to determine the percent of pure live seed in your sample. See Website below for additional calculations.

Additional Resources

- See <http://www.prairiesource.com> for a discussion and calculation of pure live seed.

Assessments

- Ask students to show how they divided up the site to calculate the square footage and to show the formulas they used for each area.

How Much Seed Do I Need? Work Sheet

Step	Answer
1. Number of square feet to be planted	
2. Number of plants to be used	
3. Number of square feet to be used for seed calculations (subtract #2 from #1)	
4. Ounces of seed needed (multiply #3 by 0.00735 ounces/square foot)	
5. Proportion of grass desired in seed mix	
6. Proportion of forb desired in seed mix	
7. Ounces of grass seed needed (multiply #4 by #5)	
8. Ounces of forb seed needed (multiply #4 by #6)	