

LEARNING ACTIVITY:

Reclaiming a Mine Site

Grades 5-9

Materials

- ♦ Mixture of gravel, sand, and silt (overburden)
- ♦ Potting soil
- ♦ Bone meal, blood meal, and potash, or mixed fertilizer, teaspoons
- ♦ Grass seeds
- ♦ Water and spray bottle
- ♦ Access to sunlight or a lamp
- ♦ Small trowels
- ♦ Shoebox-sized plastic tubs
- ♦ Measuring cups, teaspoons, large mixing bowls
- ♦ Rulers, calculators
- ♦ Data sheet



Mined land is reclaimed for future use. The objective of this activity is to investigate how plants will grow on a reclaimed landscape. Over a period of days, you will learn how overburden is incorporated into the landscape after it has been removed during the mining process. Before beginning, discuss vocabulary terms: *overburden*, *stockpile*, *grading*, *soil types*, *seeding*, *stability*, *seed germination*, *nutrients*, *closure planning*, and *reclamation*.

Procedure

1. Watch Ground Rules, Chapter 8 (www.youtube.com/user/catgroundrules).
2. With your classmates, divide up into eight groups. Your group should have a plastic tub and a garden trowel. Prepare your reclaimed landscape by:
 - ♦ Numbering your plastic tub (all tubs should be numbered 1 to 8).
 - ♦ Calculating the area of the bottom of your tub (L x W).
 - ♦ Determining the volume of overburden required for 5-cm layer in the bottom of your tub (area of tub x 5 cm) and pouring it into your tub to make an even surface of uniform thickness.
 - ♦ Visiting <https://mining.cat.com/cda/files/2786340/7/GroundRules-MiningProcesses-11-13.pdf> to download detailed descriptions of different thicknesses and mixtures of soil for each reclaimed landscape model and a data sheet for describing the composition of each reclaimed landscape.
3. Add the plants. In your group:
 - ♦ Sprinkle 4 teaspoons of seed across the surface of your model reclaimed landscape.
 - ♦ Gently pat seeds into the soil surface.
 - ♦ Spray water generously and evenly over the surface of your reclaimed landscape, making sure to apply the same number of sprays to your tub as is applied to the other tubs (count and record the total number of sprays).



First Niagara Pavilion was built on reclaimed mine land owned by Starraggi Industries™.

4. Make daily observations:
 - ♦ Place your tub along with the others near a window or under a lamp that is turned on during the day and off at night.
 - ♦ Water your model reclaimed landscape every day (as directed above).
 - ♦ Along with other groups, make daily observations of your reclaimed landscape model on your data sheet. Continue making daily observations until the grass is growing well on at least one of the groups' models.
5. Discuss:
 - ♦ On which model reclaimed landscape(s) did the plants grow the best/worst? Based on the results of the experiment, if you were planning a reclaimed landscape, how would you design it?

NGSS: MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. MS-ESS3.C Human Impacts on Earth Systems; SEP: Constructing Explanations and Designing Solutions; CC: Cause and Effect.

This activity was adapted with permission from Caterpillar Worldwide (cat.com). For additional educational resources about the importance of mining and minerals, visit www.MineralsEducationCoalition.org. To adapt this activity for grades 10-12, visit cat.com/groundrules.

