

# To Dig or Not to Dig: That Is the Question

## Description

Students conduct a garden experiment on the effects of compaction on plant growth by monitoring seedling growth in compacted and loosened soil.

## Objective

To discover the effect of compaction on plant growth.

## Teacher Background

The next two activities demonstrate the importance of planting in loosened soil. In compacted soil or dense, closely packed soil, there is less room for air; it is difficult for water to drain, so roots rot; and seedlings have a hard time pushing through the soil.

## Materials

Approximately 20 of the same variety of seedling, such as lettuce or broccoli  
A 4 ft X 8 ft garden bed or area that has not been prepared  
String  
Markers  
Spading forks

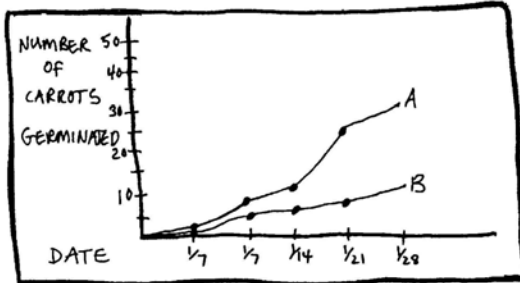


What are some ways we've learned soil is important for plant growth? Close your eyes for a minute. Imagine you are a small seedling just transplanted into soil. Picture what it is like to be in the soil. What are your roots doing? When you are ready, open your eyes. Describe what it is like to be a seedling in the soil. As gardeners, what can we do to prepare the soil for seedlings? (List responses on the chalkboard.)



1. Have the class or group gather around the selected garden area.
2. Ask each student to stick out one finger and pretend it has become a seed. Have them try to push their seed-fingers into a compacted area. They should really push around and feel how hard it is. Discuss what it would be like to grow in this soil, and how they would like to change it.
3. Divide the garden bed in half and place a string between the two sections.
4. Have students use spading forks to loosen the soil to one foot in depth in one section, labeled Bed A.
5. Now ask students to sink their seed-fingers into the loosened section. Ask them to plant their finger-seeds where they think they would grow the best. Record the predictions.

6. Have students plant Bed A and the compacted section (labeled Bed B) with the same amounts of the same kind of seedlings. Try to keep all other factors the same: The soil should be similar, one side should not have more nutrients than the other, watering should be the same, and so on.
7. Have students make weekly notes on the progress of the plants, recording in a chart which plants grow faster, get bigger, look healthier, have less insect or disease damage. Did more plants survive in one section than in the other?
8. When the crops mature, have students compare their charts.



LENGTH OF GROWN CARROT — IN INCHES —	
BED A	BED B
6	3
8	4
4	4
7	3
7	5
6	
AVERAGE 6 1/2"	3 1/2"



Which bed did better? Why? How do soils become compacted? (people walking, cows grazing, machinery, and so on) How can we prevent compaction in our garden beds? (Don't walk on them or jump through them.)