

Germination

Learning objective: To demonstrate the differences between initial germination observed as radicle emergence and seedling emergence.

Background information: This demonstration works well with either white oak or honeylocust seeds because they do not require weeks of stratification to satisfy dormancy. Both are easy to germinate. White oak works well if done in the Fall. Honeylocust can be done any time of the year.

White oak seeds (acorns) are large and easy to handle for young students. They have no seed dormancy so they will germinate in a short period of time. Radicle emergence usually occurs in a few days giving students feedback in a short period of time. They can be collected in the fall as soon as they fall from the trees. If you select those with just a small crack in the tip of the acorn, they will almost always germinate in a short time. It is best to conduct this experiment immediately after you collect the acorns. However, you can store seeds in a sealed bag in the refrigerator for several weeks before beginning the experiment, but do not allow them to dry out.



Honeylocust seeds are also large and easy to handle. You must scarify the seeds to allow water uptake into the seeds. Simply file an opening in the seed coat prior to starting the demonstration. They can be stored dry in an air tight container in the refrigerator for years.

Procedures:

1. To illustrate radicle emergence, sow seeds in a plastic container on moistened sand. The sand should be moist but not too wet. The sand should still be firm when the seeds are placed on the surface. Place the container in a sealed plastic bag to prevent evaporation from the sand surface. Place the container in a warm (70 to 75°F) area out of direct sunlight. Observe the seeds for radicle emergence after a few days. This part of demonstration should be complete after 5 days depending on the temperature.



2. To illustrate seedling emergence, sow seeds in a small container filled with a greenhouse potting mixture. It is important to use a greenhouse mix because it has been prepared to exclude any microorganisms that might cause seedling disease and has the proper mixture of air and water holding capacity to provide good conditions for seedling growth. Avoid using outdoor soil for this demonstration. Sow the seeds on their sides about one-inch below the surface. Keep the potting mixture moist to encourage germination and seedling emergence. Provide a bright light environment for seedling growth. It should take several weeks to see seedlings emerge.



3. It will be difficult to keep the white oak seedlings in good condition unless you can provide a greenhouse environment or similar area with high light. If you want to have the students move their seedlings outdoors for planting you might find it easier to store the white oak seeds until February before sowing or use the honeylocust seeds that can be sown any time after February.