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# Respiration in Roots

**Purpose**

Many organisms in the soil produce carbon dioxide. Roots of plants go through the process of respiration, and may also add carbon dioxide to the soil. The purpose of this lab is to investigate the claim that roots contribute carbon dioxide to the soil. [[1]](#endnote-1)

**Procedure**

 **Materials**

1. Seedlings (3)
2. Cotton balls
3. Test tubes (3)
4. Test tube rack
5. Bromthymol blue indicator solution
6. Graduated cylinder (1)
7. Water

**Sequence of Steps**

1. Put 10 to 15 mL of tap water in each of 3 test tubes.
2. Add 3 to 4 drops of Bromthymol blue indicator solution.
3. Insert the seedlings into the test tubes so that the roots are immersed in the dilute indicator solution.
4. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Wet the cotton and use it to support the seedlings.
5. Observe the test tubes over the next 2 to 4 days. Record your results.

**![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()**

 **Observations**

1. Why is an indicator solution, which shows the presence or absence of acid, used to demonstrate the production of carbon dioxide?
2. Repeat this exercise using other types of seedlings. Does the indicator solution change color at a different rate? Why?
3. Does the size or nature of the root system appear to have any effect on the amount of carbon dioxide produced? Why?
4. Based on your observations, do roots contribute to carbon dioxide in soil?
5. Describe the carbon cycle and how soil organisms play a role in this cycle.
1. (2008).Respiration in Roots. *Prentice Hall, Inc.* [↑](#endnote-ref-1)