

How is flower color variation in Hydrangea related to pH of the soil?

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In this Virtual Lab, you will assume the role of a gardener.

1. You will experiment with soil pH in order to grow a desired color variation of Hydrangeas.
2. You will determine which specific color of Hydrangea flower is produced given the pH value of the soil the plant is grown in.

Objectives:

- Understand that the pH scale is used to measure the strength of acids and bases.
- Use an indicator to measure pH of soil.
- Predict flower colors in Hydrangeas grown under different soil pH conditions.
- Adjust soil pH to grow Hydrangea flowers with a desired flower color.

Procedure:

1. For this Virtual Lab, you may choose to grow a specific Hydrangea flower color by adjusting the pH of the potting soil, or you may choose to predict what flower color will be produced by soil with a certain pH value.
2. **Use the Reference Card** to find information about the relationship between soil pH and Hydrangea flower color.
3. **Take a sample of the potting soil** in the Flower Pot by clicking the Take Soil Sample Button. The distilled water in the Graduated Cylinder changes color and looks like soil has been dissolved in it.
4. **Click and drag a piece of pH Paper to the Graduated Cylinder.** Once the pH Paper has sampled the soil and distilled water mixture in the Graduated Cylinder, **compare the pH paper to the pH Reference Scale.**
5. **If you want to increase the pH value of the soil, click the Lime Container Button.** To determine the pH value of the new soil sample, repeat Steps 3 and 4.
6. **If you want to decrease the pH value of the soil, click the Aluminum Sulfate Container Button.** To determine the pH value of the new soil sample, repeat Steps 3 and 4.
7. Repeat Steps 3-6 until the soil matches your desired pH value.
8. **After you have tested and adjusted the soil's pH, click the Grow Button to see the flower color of the grown plant.** The Calendar shows how long it takes for the Hydrangea to grow. If the soil's pH is too high or too low, no flower will bloom.
9. **Record the soil pH value and the flower color for this soil sample in the Table.**
10. **Click the Reset Button to grow a new Hydrangea plant.**
11. Repeat steps 2-10 to experiment with soil pH values and colors of Hydrangea plant flowers.
12. **Fill in Data Table and Analysis Questions on the next page and turn them in to your teacher.**

Name: _____ Date: _____ Period: _____

1. Data Table:
Soil pH and Hydrangea Flower Color

	Soil pH Value	Hydrangea Flower Color
Soil Sample # 1		
Soil Sample # 2		
Soil Sample # 3		
Soil Sample # 4		

2. Analysis Questions:

Directions: Answer analysis questions in complete sentences.

1. What flower color matched the lowest soil pH value you collected in which a flower was produced? What was the soil's pH?

2. What flower color matched the highest soil pH value you collected in which a flower was produced? What was the soil's pH?

3. Suppose you wanted to grow Hydrangeas with an intense blue color. Your soil has a pH value of 6.2. What needs to be added to the soil in order to produce the desired flower color?

Name: _____ Date: _____ Period: _____

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4. Suppose you wanted to grow Hydrangeas with an intense pink color. Your soil has a pH value of 4.7. What needs to be added to the soil in order to produce the desired flower color?

5. Suppose you are given soil to grow Hydrangeas in. You take a sample of the soil and determine that its pH is 6.0. What Hydrangea flower color would you expect for plants grown in this soil? Why?

6. Suppose you are given soil to grow Hydrangeas in. You take a sample of the soil and determine that its pH is 7.5. What Hydrangea flower color would you expect for plants grown in this soil? Why?

7. What is the relationship between Hydrangea flower color and soil pH?