

## AP Biology Summer Assignment

AP Biology extends learning about biology from simply memorizing facts to an application of knowledge, understanding of scientific processes, and the analysis of scientific data. The purpose of this summer assignment is to give you an idea of the types of scientific experiments and data you will be analyzing throughout the year. There are TWO parts to this summer assignment. The first part is reading a scientific article and answering questions (both are in separate links). Notice the **due date** listed. You need to answer the questions and submit them electronically (it is fine to just open a blank word document and answer the questions on that, numbered appropriately). Email them to me at: **jenee.mora@yourcharlotteschools.net**

- 1) Read the article: "Invasive Plant Suppresses the Growth of Native Tree Seedling by Disrupting Belowground Mutualisms." Answer the 5 pre-read questions and #1 – 25 at the end of the article.

**DUE BY: August 6<sup>th</sup>**

*\*Note: This assignment is my first impression of your work ethic. Answers should be complete sentences and original (meaning your answers should not be exactly the same as someone else's).*

- 2) The second part has nothing to turn in and is listed below. This is a list of chemistry topics that you should already know. **You will have an assignment on the first day of school that covers these topics.** Be sure to review them over the summer:

- Know how to determine the subatomic particles (protons, neutrons, electrons) using a periodic table.
- Know how to determine an atom's valence electrons.
- What is the difference between ions and isotopes? How does the number of subatomic particles change for each of those?
- What's the difference between ionic and covalent bonds?
- What's the difference between polar and nonpolar covalent bonds?
- How does electronegativity influence bonding? What is the electronegativity trend on the periodic table?
- What is a hydrogen bond? Between what types of molecules do they form? Where do you find them in living things?
- Be able to draw simple molecular structures if given a molecular formula. Know how many covalent bonds each of the following will form: C, H, O, N
- Know the following about water:
  - Why hydrogen bonds form between them
  - Cohesion vs adhesion
  - Why ice floats
  - Why water is a great solvent
  - Hydrophilic and hydrophobic substances

These following topics will be reviewed, but it would help if you already have an understanding:

What is an acid and what is a base? (in terms of ability to release or pick up hydrogen ions)

What does pH measure? (Know it in terms of concentration of hydrogen ions)

What are some common examples of acids or bases? Know how to identify one by its structural formula.

Know what a "redox" reaction is. What does it mean to be oxidized? To be reduced?

**Pre-Read** for the article, “Invasive Plant Suppresses the Growth of Native Tree Seedling by Disrupting Belowground Mutualisms.” Before reading the entire article, read the experiment summary. If you can’t answer these questions now, come back and answer when you’re done with the article.

### QUESTION

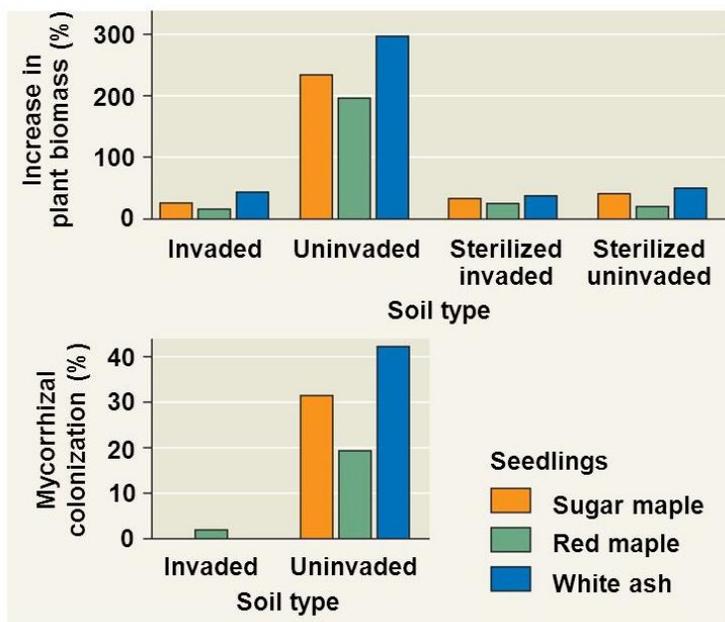
Does the invasive weed garlic mustard disrupt mutualistic associations between native tree seedlings and arbuscular mycorrhizal fungi?

### EXPERIMENT

Kristina Stinson, of Harvard University, and colleagues investigated the effect of invasive garlic mustard on the growth of native tree seedlings and associated mycorrhizal fungi. In one experiment, they grew seedlings of three North American trees—sugar maple, red maple, and white ash—in four different soils. Two of the soil samples were collected from a location where garlic mustard was growing, and one of these samples was sterilized. The other two soil samples were collected from a location devoid of garlic mustard, and one was then sterilized. After four months of growth, the researchers harvested the shoots and roots and determined the dried biomass. The roots were also analyzed for percent colonization by arbuscular mycorrhizal fungi.

### RESULTS

Native tree seedlings grew more slowly and were less able to form mycorrhizal associations when grown either in sterilized soil or in unsterilized soil collected from a location that had been invaded by garlic mustard.



### Pre-Read Questions

1. Soil types are listed as Invaded or Uninvaded. What were they invaded by?
2. What is the Independent Variable of this experiment?
3. What effect does the invasion have on mycorrhizal colonization?
4. What effect does the invasion have on plant growth?
5. What was the purpose of sterilizing some of the soil?

### CONCLUSION

The data support the hypothesis that garlic mustard suppresses growth of native trees by affecting the soil in a way that disrupts mutualistic associations between the trees and arbuscular mycorrhizal fungi.

Now, read the article and answer the questions.