In this module, you will think about germination and plant growth by working to grow the tallest possible corn seedlings. After growing your plants, you will discuss what you learned with your classmates. Here’s what’s in store:

- **Get re-acquainted with plants**: You will have opportunities to practice caring for corn seedlings and learn how to tell what conditions are best for plant growth.

- **Independent investigation**: You will decide what conditions you think will produce the tallest corn seedlings. After growing your plants independently, you will measure their heights and compare their growth against plants your classmates have grown.

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**Maize is No Mystery**

**Corn is the most important agricultural crop in the United States.** Native Americans first domesticated corn, also known as maize, from its predecessor, teosinte. Over thousands of years, their work changed the harvestable crop from two rows of small, easily lost seeds to large cobs that firmly hold hundreds of kernels. More recently, modern farmers, agronomists, geneticists, and plant physiologists have worked for decades to continually increase corn yields for food, animal feed, and industrial products, including biofuels. With all this effort, Americans have collectively gained knowledge making the United States the best corn grower in the world…but what do you know about growing corn?

Do you know how fast corn typically grows when planted in a large field? This time-lapse video of Farmer Josh’s corn will show you: [http://www.youtube.com/watch?v=Miyjun0uD4g](http://www.youtube.com/watch?v=Miyjun0uD4g)

What about the environmental conditions that seeds require for rapid germination? Farmers are careful to plant corn seed only when the soil has warmed up in the springtime. Seeds need to absorb water to germinate, but germination and growth are slower at cooler temperatures. If a seed doesn’t germinate quickly enough when it’s wet, bacteria or fungi may be able to attack and eventually kill it.

Once corn seeds have germinated, how does the environment affect seedling growth? All plants need light for photosynthesis, and photosynthesis requires specialized enzymes to occur. Seedlings need nutrients to help make these enzymes. You may need to do a bit of research to discover which nutrients are the most important for the best corn growth.
In this contest, you will get the maximum number of points if you can grow corn plants that are taller than those grown by most other students.

You will get one or two pots – your choice. You will also receive vermiculite as potting material and five corn kernels for each pot (a total of either five seeds if you choose one pot, or ten seeds if you choose two). You will take these materials home and grow your corn for three weeks, using whatever conditions you think will produce the tallest plants.

At the end of three weeks, bring the corn plants back to the lab to measure the plants in one of your pots. The total height of all the plants in one pot, not just the height of the tallest plant, will be used to determine which students’ plants grew the fastest. The students who brought in plants with a total height among the top one-third of the class will receive the maximum number of points. Students who bring in living plants not in the top third will receive half the points. You must turn in your plants in the same pot that we gave you, and you cannot transfer (transplant) plants from one pot to another. If all your plants die, or if you don’t turn in any living plants, you will not get any points!

**Here’s the Catch:** To receive the full points, you must also be able to convince your teacher that you know why your plants grew as tall as they did. Your plants may have been taller than others, but how do you know that what you did to your plants actually caused them to grow taller? How do you know they aren’t simply tall plants due to random chance?

**Some Things to Consider:** Everyone will have the same number of seeds per pot, potting material, and type of pots. In general, corn needs the same things that all plants need to grow. What are these things? You should be able to find some information about growing plants online or in a library. You will probably also be able to find information specific to corn, which might help you get an edge over your classmates.

When explaining how you know that your plants were taller because of what you did to them, you will need to describe the details for your particular case. Will it be convincing enough to refer only to general information you have read?

✉️ Good luck, and good growing! ☝️