



BIG GREEN LESSONS

Plant Needs: 6th – 8th Grade

Lesson Outcomes

Students will participate in a debate about plant needs and the importance of each of these needs for a plant to grow healthy and strong.

- Plants need specific things to be healthy, just like humans need specific things to be healthy, including protein and all the components of a healthy meal.
- Plant needs include: light, air, water, nutrients, and space.

Standards Alignment

Common Core

- SL.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups and teacher-led) with diverse partners on grade 6 topics, texts and issues, building on others' ideas and expressing their own clearly.
- SL.6.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume and clear pronunciation.
- SL.7.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- SL.7.4. Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
- SL.8.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- SL.8.4. Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Next Generation Science Standards

- MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.



Materials and Preparation

- The Great Plant Debate worksheet – one per student
- Clipboard or hard surface for sketching and coloring – one per student
- Pencil – one per student
- Review lesson, materials, and preparation
- Familiarize yourself with your Learning Garden

Reminder: Big Green's Garden Educators are always available for additional support via email or by phone call.

Teacher Background

Plants meet their needs in different ways in different environments because the availability of resources varies from one ecosystem to another. Plants, like all living things, have basic needs that must be met for them to survive.

These needs include: light, air, water, a source of nutrition, space to live and grow and optimal temperature.

There is an easy acronym to help remember basic plant needs (the things that plants need to survive and thrive): L.A.W.N.S.

LIGHT: Leaves capture energy from the sun, then convert and store that energy as a type of sugar called glucose. Plants use glucose to grow strong and eventually flower and reproduce. Sunlight also provides heat which is needed for plants to survive. Each plant has an optimal temperature range depending on the crop and the variety. The sunlight and changing seasons allow us to grow a variety of crops at different times during the year based on the optimal growing season.

AIR: Plants take in carbon dioxide (CO₂) from the air and convert it into glucose (a type of sugar) through the process of photosynthesis, which is powered by sunlight.

WATER: All living things, including plants, are comprised mostly of water. In fact, the human body is made up of 2/3 water. Water supports the transportation of nutrients from the soil up into the structures of the plant, is used in the process of photosynthesis, helps keep plants standing strong and upright and not wilted or droopy, and helps keep plants cool as it evaporates from the leaves.

NUTRIENTS: Plants must take up essential nutrients from the soil to support their growth. These nutrients include nitrogen, phosphorus, potassium (commonly listed as N-P-K), calcium, and magnesium. Plants also need hydrogen, oxygen, and carbon in large quantities, they're able to absorb those nutrients from the air and water.

SPACE: Roots and foliage take up space. Each plant has their own specific space requirement needs. Plants that are spaced too close together will be stressed as they



compete for their basic needs, resulting in weaker plants, higher susceptibility to diseases and insects, and ultimately poor food production.

Introduction

Spend time discussing the following introductory question:

- What do plants need to grow?

Make a list of student responses on the board and group or categorize responses together. Discuss and strike out any responses that are not a plant need.

Classroom Activity

During the classroom portion of today's lesson students will be learning about the needs of plants using the acronym L.A.W.N.S.

1. On the whiteboard or a large piece of paper, write the letters L.A.W.N.S. vertically. Let students know that the plant needs they just shared can be distilled down to the acronym L.A.W.N.S. (Define or review *acronym* if necessary.)
2. Distribute the Great Plant Debate worksheet and ask students to take notes in the "Background Information" section on the acronym L.A.W.N.S. as you define it together. Let students know that their notes will be helpful during the Great Plant Debate activity.
3. Invite your class to try to fill in each word associated with L.A.W.N.S.
4. As your students correctly fill in each letter of the acronym (or after you've filled in the entire acronym) describe and define each plant need, elaborating on the needs with information from the Teacher Background section above and how it relates to your Learning Garden.
5. You may ask students to take notes on the acronym L.A.W.N.S. and record the definition of each plant need on their worksheet.

LIGHT: supports photosynthesis, which is a process where plants turn air and water into glucose (stored energy). In addition, sunlight also provides heat which plants need to grow; each plant has an optimal temperature for germination and growth.

AIR: Carbon dioxide (CO₂) is pulled from the air and converted into glucose (food) through the process of photosynthesis.

WATER: supports photosynthesis and nutrient uptake, and nutrients travel throughout the entire plant via water.

NUTRIENTS: found in the soil and taken up by the plants roots. Nutrients support healthy plant growth.

SPACE: Roots and leaves need room to grow and spread out, and each plant has its own spacing needs.



7. Break your students into five groups and assign each group a plant need. Have your students record their assigned plant need and group member names on the Great Plant Debate worksheet. Once groups are formed, review the "Introduction Section" on the Great Plant Debate worksheet.
8. If time allows, have your students spend the rest of the class period prepping for the Great Plant Debate.

Break here if this lesson will be taught in two sections.

Garden Activity

Assemble and welcome your students into the Learning Garden. Address the entire group and establish the expectation that this is a time for learning. If appropriate, review the agenda for the Garden Activity with your students. Ask students if they know what they will be doing in the Learning Garden today. Let them know they will be looking for evidence to participate in the Great Plant debate!

1. Remind your students of the acronym they learned about during the classroom lesson (L.A.W.N.S.) and review the plant need associated with each letter.
2. Break your students into their five groups, distribute a clipboard and notepaper to each group, and review the Great Plant Debate.
3. Have each a team prepare an opening argument and closing argument that uses evidence to support their claim that their plant need is most effectively met in the Learning Garden.
4. Have each side present their opening arguments first, followed by rebuttals as time allows and finally each side ends with a closing argument. Appoint a winning side based on who made the stronger case.

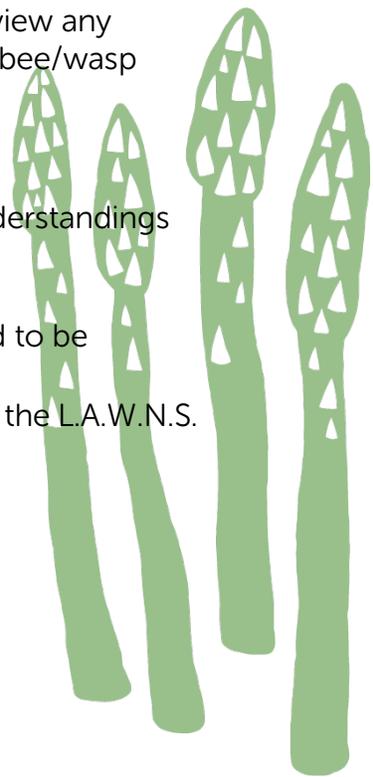
NOTE: As the teacher, be aware of poisonous plants and other hazards in and around your Learning Garden and review those concerns with your students. Review any additional Learning Garden rules with the students. Inquire about known bee/wasp stinging allergies before going into the Learning Garden.

Conclusion

Have students share key parts of the day's activity and review the Key Understandings for this lesson. Review the following questions with your students:

- Do all plants need the same amounts of L.A.W.N.S. to thrive?
- Are the plants in our Learning Garden getting everything they need to be healthy? Which plant needs are being met and which are not?
- Are there any plants we might want to move to provide them with the L.A.W.N.S. they need to do even better?

Students should clean-up the Learning Garden as needed.



Name:

Date:

The Great Plant Debate

Introduction:

Plants have needs that must be met in order to grow healthy and strong. In today's plant debate, your group will be finding evidence to support a claim that your plant's needs are most effectively being met in the Learning Garden.

NOTE: Evidence includes observations and measurements to support your claim.

Background Information:

Plant Need	Description
L.	
A.	
W.	
N.	
S.	

My Plant Needs:

My Group Members:

The Great Plant Debate

Opening Statement:

Learning Garden Evidence:

Closing Statement: