

Lesson: A Plant's Life

Common Core Standards:

Next Generation Science Standards

NGSS.5.LS1.1

Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]

Objectives:

To identify different parts of a plant and understand their role within the plant's life cycle.

To identify and explain a variety of life processes within the plant.

To explain why these things are important to the life of a plant.

"What did one plant say to another? What's stomata?"

- Pun of The Day

Key words: Vocab Tree

Photosynthesis; Chloroplast; Chlorophyll; Cellular Respiration; Transpiration; Stomata; Xylem

(Using Key words: Students can create a glossary, in books or on wall in classroom. Students are encouraged to practice using vocab in written or verbal sentences - perhaps writing example sentences and displaying them. Students could earn points for using the vocab in novel sentences each week).

Resources:

- PowerPoint - 'A Plant's Life'
- Plastic bags
- Twist ties
- Graduated cylinder
- Selected garden plants or tree branches within reach

Activities:

Introduction

Ask students what they know about plants and the different life processes that are continuously taking place within the plant. Using 'A Plant's Life' PPT explain these processes and why they are important to the plant.

Class Discussion

(Show 'A Plant's Life' PPT)

Q: What does a plant need to survive? (Water, sunlight, carbon dioxide, oxygen)

Q: What does the plant use these resources for? (Photosynthesis, cellular respiration,

transpiration)

(Advanced Discussion - Plants use sunlight and carbon dioxide for photosynthesis, oxygen is key in cellular respiration, transpiration allows for gas exchange)

Q: What is responsible for making plants green? (Chlorophyll)

(Advanced Discussion - Chlorophyll absorbs most light wavelengths and reflects green light back to our eyes)

Q: What energy source do plants use to carry out metabolic processes? (ATP)

Healthy Growing Session (if participating)

Measuring Transpiration

Select two or more low hanging tree branches (or designated plants in your garden); with at least one being in full sunlight and another being in mostly shade.

Once selected, cover each plant with a plastic bag and secure with a twist tie.

Each day for a week remove the bags, being careful not to spill any of the collected water. Once the bag is removed, carefully pour the water into a graduated cylinder and measure what has been collected. Repeat this step for every branch or plant chosen for the activity.

Along with data on water collection, include the time collected, outside temperatures, weather conditions at the time of collection, amount of sunlight the branch is exposed to, etc.

Repeat these steps and observations at the same time each day for a minimum of a week.

Discussion

After data collection for the designated time period is completed, ask the students to analyze the data and look for any patterns.

How much water in total was collected?

Which branch produced the most water?

Which branch produced the least?

Where were these branches located; in direct sunlight or shade?

Did sun exposure affect the amount of water produced?

Did outside temperatures affect how much water was collected?

Where is this water coming from and how is it being released from the plant?

Do you think the amount of water produced early in the morning would be different from the

amount of water produced midday? What about at night?

Recap

Why is transpiration important to the plant?

What is transpiration dependent on in order to take place?

What factors affect transpiration rates and why?

Further Activity

Change the time the class collects the water from the branches. How does this new data compare with previous data collected? Does the time of day effect the amount of water produced? Why?

Curriculum Standards Addressed:

Kindergarten- Standard Set 2: Life Sciences (c); Standard Set 4: Investigation and Experimentation (e)

Grade One- Standard Set 2: Life Sciences (e); Standard Set 3: Earth Sciences (a,b,c); Standard Set 4: Investigation and Experimentation (b,c,e)

Grade Two- Standard Set 4: Investigation and Experimentation (a,b,c,d,e,g)

Grade Three- Standard Set 1: Physical Sciences (Energy and Matter) (a,b); Standard Set 5: Investigation and Experimentation (a,b,c,d,e)

Grade Four- Standard Set 6: Investigation and Experimentation (a,b,c,d,e,f)

Grade Five- Standard Set 2: Life Sciences (a,b,c); Standard Set 6: Investigation and Experimentation (a,b,c,d,e,f,g,h,i)

Grade Six- Standard Set 5: Ecology (a,b); Standard Set 7: Investigation and Experimentation (a,b,c)