

# Trees

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Grade Level (Req.): 9-10	Content Area (Req.): Biology	Unit (Opt.): Botany; Photosynthesis; Ecology
Connections to Other Disciplines (Opt.): <ul style="list-style-type: none"> <li>• Geography</li> <li>•</li> <li>•</li> </ul>		
Time Frame (Req.): 2 class periods for background information and to learn how to use GPS; 3 half days to gather data; 5 class periods to disseminate the data and talk about ecosystems and ecology.	Goal (Req.): To use GPS to locate and mark the location of different species of trees to be studied.	
	Objective (Req.): The student will be able to locate, identify, and understand the photosynthetic cycle of 6 species of trees. The student will also be able to explain physical observations made of each tree.	
Materials Needed (Req.): <ul style="list-style-type: none"> <li>• GPS unit (1 per group)</li> <li>• Tree characteristics (identification) handout</li> <li>• Notebook and pencil</li> <li>• Plastic bags</li> <li>•</li> <li>•</li> <li>•</li> </ul>	New Vocabulary (Opt.): <ul style="list-style-type: none"> <li>• mutualism</li> <li>• commensalism</li> <li>• parasitism</li> <li>• botany</li> <li>• Ecosystem, ecology</li> </ul>	
Anticipatory Set/Introduction [Inquiry Question is required] (Req.): The student will use what they previously know about trees and animals to answer the following questions. We will list their responses on the board. After each trip into the woods, we will come back to our previous answers to see if the answers have changed. 1) Why do some trees of the same species grow tall and slender while others are more spread out? 2) How do people choose where they live? (Do animals do the same?). 3) What other kind of things do you see at the base of trees and on the tree? 4) Do all trees leaves turn the same color? 5)a. Do all trees drop there leaves /b. grow new leaves at the same time?		
Instructional Sequence/Procedure (Req.): <ol style="list-style-type: none"> <li>1. Introduction to botany. What is botany? Are trees important?</li> <li>2. Teach the students basic latitude and longitude</li> <li>3. Teach the students how to mark waypoints.</li> <li>4. Teach the students how to navigate to a point.</li> <li>5. Go outside and practice using GPS units from AEA.</li> <li>6. Day 1 September: locate 6 trees and mark as waypoints.</li> <li>7. Collect a leaf from the tree and identify physical characteristics of the tree and its surroundings.</li> <li>8. During class time, answer questions 1,2, and 3</li> <li>9. Teach about ecosystems and the terms mutualism, commensalism, and parasitism. Did we see</li> </ol>		

- observations about the tree’s leaves (if any remain). Identify and record any other physical features you observe about the tree and it’s surroundings.
11. During class time, answer questions 4 and 5a. Revisit questions 2 and 3. There may be observations that were more easily noticed with less leaves on the trees.
  12. Day 3 April: go find your six trees (waypoints) using GPS unit. Identify and record observations about the tree’s leaves and surroundings.
  13. During class time, answer question 5b.
  14. Discuss what Arbor Day is (last Friday in April)
  15. Plant a tree(s) on school grounds
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  - 17.
  - 18.
  - 19.
  - 20.

<p>Formative Evaluation (Req.): Three leaf collections and corresponding questions</p>	<p>Assessment (Req.): Throughout the year, students will write a three page narrative paper beginning with “If I were a.... (e.g. squirrel)” or “I am a.....(e.g. elm tree)” . After each leaf collection, students will add a new page discussing how the tree has changed throughout the year. If they decided to be a tree, they will write from the tree’s point of view, if they chose to be a squirrel, they will write from the squirrel’s point of view, etc..</p>
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- Iowa Core Curriculum Standards Used (Req.):
- **Geography 1., Grades 9-12: Understand the use of geographic tools to locate and analyze information about people, places, and environments.**
  - **Science as Inquiry 5., Grades 9-12: Think critically and logically to make the relationships between evidence and explanations.**
  - **Science as Inquiry 6., Grades 9-12: Recognize and analyze alternative explanations and predictions.**
  - **Life science 4., Grades 9-12: Understand and apply knowledge of the interdependence of organisms.**
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- Common Core Curriculum Standards Used (Opt.):
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- NGS Standards Used (Req.):
- Standard 1: How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information
  - Standard 4: The physical and human characteristics of places
  - Standard 8: The characteristics and spatial distribution of ecosystems and biomes on Earth's surface
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Five Themes of Geography Used (Req.): <ul style="list-style-type: none"><li>• location</li><li>• place</li><li>•</li><li>•</li><li>•</li></ul>	School District Standards and Benchmarks (Opt.): <ul style="list-style-type: none"><li>•</li><li>•</li><li>•</li></ul>
21 <sup>st</sup> Century Universal Constructs (Opt.):	
Other Disciplinary Standards (Opt.): <ul style="list-style-type: none"><li>•</li><li>•</li><li>•</li><li>•</li><li>•</li></ul>	
Other Essential Information (Opt.):	
Other Resources (Opt.): <ul style="list-style-type: none"><li>•</li><li>•</li><li>•</li><li>•</li></ul>	