



TREE TRAILS

2-3

★ SECONDARY ★

★ TREE AND FOREST HEALTH ★

History has shown us the risk of planting too many of the same species in the urban forest. Cities and forests have lost millions of trees to foreign or species-specific diseases and insect pests. Exotic tree species can sometimes invade our forest landscapes and crowd out native species.

Goal and Objectives

Goal: Students will demonstrate ways to keep trees and forests healthy.

Objectives: Students will

1. Specify the causes of the major disruptions to a healthy forest.
2. Conduct a research investigation on forest health; complete a report and present conclusions to the class.
3. Evaluate the health of the campus landscape and name ways to maintain its health.

Materials

General

- Tablet(s) or computer(s) with internet access
- Projector and screen
- White board or chart paper and markers
- Tree Trails Portfolio, Student Learning Log/Journal

Handouts

- Tree Cross Sections
- Signs of Unhealthy Trees Guide
- Investigative Report Outline
- Investigative Procedures
- Research Topics
- (Optional) Media Presentation Instructions

Activity Materials

- Cameras or camera phones

Time and Internet Links

Instructional Time: 3 sessions, 45 minutes each

- Trees of Texas, How Trees Grow
<http://texastreeid.tamu.edu/content/howTreesGrow/>
- Texas A&M Forest Service, Forest Health
<http://tfsweb.tamu.edu/foresthealth/>
- The Nature Conservancy, The Benefits of Prescribed Fire Video
<http://www.nature.org/ourinitiatives/habitats/forests/howwework/maintaining-fires-natural-role.xml>
- Good Fires, Fighting Fire with Fire
<http://goodfires.org/fire>
- Texas A&M Forest Service Forest, Forest Health Thinning Pine Plantations: Why, When and How?
<http://bit.ly/2dVW00N>
- U.S. Forest Service, Forest Insect & Disease Leaflets
<http://bit.ly/2dw0ko1>
- Arbor Day Foundation, Tree Health Guide
<https://www.arborday.org/trees/health>
- Southern Group of State Foresters, Forest Health
<http://www.southernforests.org/rural/forest-health-1>
- Western Forestry Leadership Coalition, Forest Health
<http://wflcenter.org/priority-issues/forest-health>
- Northeastern Area Association of State Foresters, Issues
<http://www.northeasternforests.org/content/issues>



Instructional Procedures

I. Engage/Excite

1. Ask the students to imagine their life as a growing tree. Ask what they *Know* that may determine tree growth and its life; i.e., what affects the health of a tree, what makes it grow fast or slow. List their responses on a chart/whiteboard or in their journal.
2. Tell students that foresters use cross sections of a tree to help determine a tree's health, age and to find other important information related to a tree's health and the health of the forest where it is growing.
3. Provide students with Tree Cross Sections handout and actual Tree Cookies, if available. The handout contains signs about a tree's health and its life. Tree rings tell if the tree had sufficient food, water, if it was crowded, if there was an insect invasion, disease, or fire, etc. Ask students to notice the different tree rings sizes and markings on the handout.
4. Have students read the information about each tree cross section and the information to estimate the age of a tree.

II. Explore

1. Activate "Team Forest Investigators" to investigate Forest Health. Divide students into small groups of four or five to create an investigative documentary entitled "Who are the Real Culprits of a Sick Forest."
2. Provide all students with a Signs of Unhealthy Trees handout. Before they begin their online investigation, take the students outside with their handout to explore the health of the trees on school grounds. Students should take photos and/or make drawings of their findings.
Teacher Tip: Invite an arborist to visit the campus grounds with the class or take a field trip with an arborist to discuss and view community urban or rural forest health issues.
3. Have the students return to the classroom and lead a discussion of their findings. Tell students to keep their notes in their Portfolios to include in their scientific research investigation.

III. Explain

1. Provide each group with a topic to investigate. Each topic will be a Chapter in the Documentary. You or the class may choose a list of topics or use the Research Topics handout which includes corresponding internet resources.



III. Explain continued

2. Provide each group with a list of Investigative Procedures and Report Guidelines handout and explain each step.
3. Have the students go online to research their topic or chapter of the report. Provide each group with a Report Outline format to use as a guideline to compile their report.

IV. Extend/Elaborate

1. Instruct student groups to develop a "stage" for each group to present their Chapter of "Who are the Real Culprits of the Forest." Have each group present their Chapter. Have students display their visuals, audios and their completed report. They may conduct a question and answer session after the presentation.
2. (Optional) During their presentations, the students may role play a healthy tree becoming unhealthy due to their specific type of disruption. One or two student(s) play(s) the tree, one or two student(s) play(s) the culprit or disrupter and one student narrates the event. Students may make and use props for their roles. For example, tree with brown paper trunk and green hair, disrupter with paper plate face of bug/disease/invasive species and narrator with microphone.
3. After the presentations, have students respond by generating conclusions about healthy and unhealthy trees and the disruptions. List their conclusions on a chart/whiteboard.
4. (Optional) Explain to students how to make a media production out of the investigative documentary report. Let students know you will help facilitate the production but they will be the directors, producers, writers and performers. Have each group assign roles for their members. Provide the Media Presentation Instructions and discuss the directions. Have students record the presentation.

V. Evaluate

1. Discuss how the class can use their ideas to develop a class plan or list of ways to maintain and/or improve the forest health around their school or neighborhood. Have the students make a poster or bulletin of their plan to improve the forest health around their school or community and display it in the room, hall or on the school's website.
2. Ask students what they *Learned* about tree health and list on a whiteboard/chart or their journal.



VI. Extra Mileage/Attention

Extra Mileage: Have students pose a hypothesis to investigate a question of interest. Have them conduct their research and present it at a convenient time for extra credit, a prize, a privilege, etc.

Extra Attention: Have students brainstorm ideas about their part of the report that they liked the most and why and the part they did not like, why and what they may do to change their dislikes.

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