TREE TRAILS

★ BENEFITS AND VALUES ★

Advances in the science of urban forestry allow us to assign monetary values to a wide range of benefits that trees provide. As trees grow, these values rise. This is the only part of the built environment of our cities that does so!

Goal and Objectives

Goal: Students will determine the benefits of trees and calculate their value.

Objectives: Students will

1. Use technology to calculate the value of their trail trees.
2. Analyze a wide range of benefits that trees provide.
3. Evaluate which trail tree(s) offers the most benefits and value.
4. Develop a plan to maintain and improve the value of trees on their Tree Trail.

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 Scavenger Hunt and Answer Sheet
- Annual Benefits Breakdown
- Campus Care and Greening Plan

Time and Internet Links

Instructional Time: 3 sessions, 45 minutes each

- Arbor Day Foundation, Benefits of Trees
  https://www.arborday.org/trees/index-benefits.cfm
- Texas A&M Forest Service, Benefits of Trees
  o Environmental, http://bit.ly/2e1LvuV
  o Social, http://bit.ly/2dEp5iY
  o Economic, http://bit.ly/2cT1Ux2
- i-Tree Design
  https://www.itreetools.org/design.php
- i-Tree Lessons, 7 Tree Planting Design
  http://www.itreelessons.com
- Create a WIKI page
  http://bit.ly/2dJyO3H
- Create a Class Blog
  http://wikihow.com/Start-a-Blog-on-Blogger
- Keep America Beautiful Student and Leader Learning Guides
  Discover What Trees Do For Your Community
  https://www.kab.org/our-programs/education/student-and-
  leader-learning-guides
- The Nature Conservancy, If Trees Could Sing
  http://www.nature.org/iftreescouldsing

Instructional Procedures

I. Engage/Excite

1. Engage students in a conversation about the benefits and values of trees and ask students what they would like to know. List their responses on a whiteboard/chart. Create a Class Blog where every student reflects on their experience.

2. To get started in learning about values and benefits of trees, students will participate in a Tree Scavenger Hunt. Divide the class into four groups and give them the Tree Scavenger Hunt Handout with a list of items in three levels of difficulty to find the item or a picture of it. Give each team approximately 10 minutes to find the items. Appoint a score keeper. Points are earned according to difficulty level.

3. Give the students the Scavenger Hunt answer sheet handout and let them total their scores. Each group should report their findings and scores. Check the items and scores and declare a winner.

4. Conclude with a discussion about the benefits and value these items mean to our community and the world. Use their responses to introduce the next activity.

II. Explore

1. On a chart/whiteboard use a graphic organizer to illustrate the relationship between three concepts of "Growth, Benefits and Value." Write the word "Growth" in the first box, next draw an arrow to a second box with the word "Benefits" in it, then draw another arrow from the "Benefits" box to the last box with the word "Value" in it.

2. Move students into small groups. Have each group brainstorm what growth means to them. Have students record their responses using their laptops/tablets or chart paper labeled "Growth." Have each group share their lists/charts with the class. If they used the laptop, have them print out the list. Place each group's list under the "Growth" box on the class chart.

   Teacher Tip: Before continuing the activity about Benefits, review the forestry definitions of Benefits and Value: benefits are a list of items and value is a dollar calculation. (Optional: Use a Compare and Contrast graphic organizer to further explain the definitions of benefits and value.)

3. Repeat the activity for the "Benefits" box to capture what benefits trees and forests provide. Remind students to use some of the items they found in the Scavenger Hunt. Remind them of other benefits such as lumber, wildlife habitat, recreation and air quality. Discuss how growth relates to benefits. Ask each group to share their lists/charts with the class. Place each groups list under the "Benefits" box.

4. Repeat the small group activity for the "Value" box. Discuss how benefits relate to value. Their list should include ways trees contribute economic dollar value.

II. Explore continued

5. When all groups have shared all three concepts, ask students to check to see if they would like to add other ideas they have learned about the benefits and values the ecosystem contributes.

   Teacher Tip: Forests provide a wide range of ecosystem services. In addition to providing food, fuel and fiber, forests clean the air, filter water supplies, control floods and erosion, sustain biodiversity, genetic resources, and provide opportunities for recreation, education, and cultural enrichment. Many other social and economic benefits exist, find more information on the Arbor Day Foundation and Texas A&M Forest Service websites.

III. Explain

1. Provide students with the Annual Benefits Breakdown handout. Ask students to notice the types of benefits: stormwater intercepted, air quality, carbon dioxide, energy savings, and property value. Conduct a question and answer session to check on understanding of the terms.

2. Project the Tree Trails map. Ask students to follow on their tablet/laptop as projected. Open the Tree Trails application and search by the school Tree Trail name. After selecting the green trail line, they should see the name of their trail under the "Annual Benefits" column heading. The dollar values shown are for all the trees on the entire trail. Discuss the benefits and value that the entire trail provides for the school. Print the trail report to display in the class.

3. To find the benefits and dollar value of each tree, have students move into their Tree Trail groups. Using their laptop/tablet, find their trail on the map. Select their tree to view the benefits in the Annual Benefits column. They should see their tree's species listed above the pie chart. Have each group conduct a discussion about the benefits their tree provides. Ask students to determine what type of benefit has the highest percent and dollar value. Have each group record their tree's values in their Learning Logs.

IV. Extend/Elaborate

1. Have students calculate the benefits of their tree(s) for current and future years using a future/forecasting model. Have students go online to i-Tree Design. Enter the address of the school or other location. Follow the instructions and outline the building/house, then add tree data and place the trees. Choose the number of years in the estimate benefits tab to calculate benefits. Tree benefit results include estimates for the current year, the specified future year, projected totals across that future timespan, and the total benefits provided to date. Have students ask for any number of years and look at the pie and line graphs. Discuss the results. Have students print out this report.

IV. Extend/Elaborate continued

2. After the investigation(s) ask each group to discuss their reports and the overall results of their research. They should save the results to use for planning a Campus Care and Greening Plan.

3. (Optional) Inform students that resources are available to assist them with developing a Campus Care and Greening Plan. They have become the school leaders as student urban foresters on campus. They will take their leadership as a Student Tree Board to establish a Campus Care and Greening Plan to ensure their Tree Trail and other trees on campus will be maintained in the future for all to enjoy. Use the handout for further instructional procedures.

4. (Optional) Have groups create a podcast or video about their trail tree and its benefits to themselves and the community. Encourage groups to vary the roles from the Lesson 2-1 video skit. Plan, record, produce and present the video. Inspiration can be found from The Nature Conservancy's If Trees Could Sing videos.

V. Evaluate

1. Have each Tree Trail group collaborate and draw a picture of the new landscape design, including their school's Tree Trail. They may use symbols and a legend. Then indicate on the drawing the trees and other plants that will increase the benefits to the school's environment.

2. Ask students to label what types of benefits they displayed.

3. Have student groups share their drawings, ask for input and make changes accordingly.

4. (Optional) Establish benchmarks for summative and formative evaluation of the Campus Care and Greening Plan, if created, and make changes as appropriate.

VI. Extra Mileage/Attention

Extra Mileage: Have each student develop a personal home/apartment greening design based on the benefits and value it would provide.

Extra Attention: Provide small groups with chart paper and markers. Ask them to draw a picture of a home without landscaping. Have the groups exchange drawings and ask each group to add trees to the drawing. Lead a discussion about increased value to the home and what benefits the trees provided.

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