Trees are Terrific

Environmental Education for Grades 1-8

Program Summary: The Trees are Terrific curriculum, developed by the Heartland Tree Alliance of Bridging the Gap, aims to inspire responsible environmental stewards and encourages students to be active outdoors while exploring, appreciating, and learning to care for the natural world.

Current scientific research suggests that trees are crucial for our future cities and for human health. The benefits of trees can be placed in five categories:

- health and well-being,
- cognitive development and education,
- economy and resources,
- climate change mitigation and habitat
- green infrastructure.

Trees can cool our cities with shade and evapotranspiration, make people happier, sequester carbon dioxide, connect communities, control stormwater, provide critical habitat for moths and butterflies, inspire artists, and so much more. Teaching about trees is inherently interdisciplinary when we discuss the full breadth of their benefits. The curriculum incites critical thinking and inquiry by coupling practice with content, **which is in line with the Next Generation Science Standards**. Lessons engage multiple learning styles and senses and integrate a naturalist approach by imparting specific information about the ecosystems in which we live. Many activities are conducted outside, which, research has shown, could boost attention in the classroom afterward.

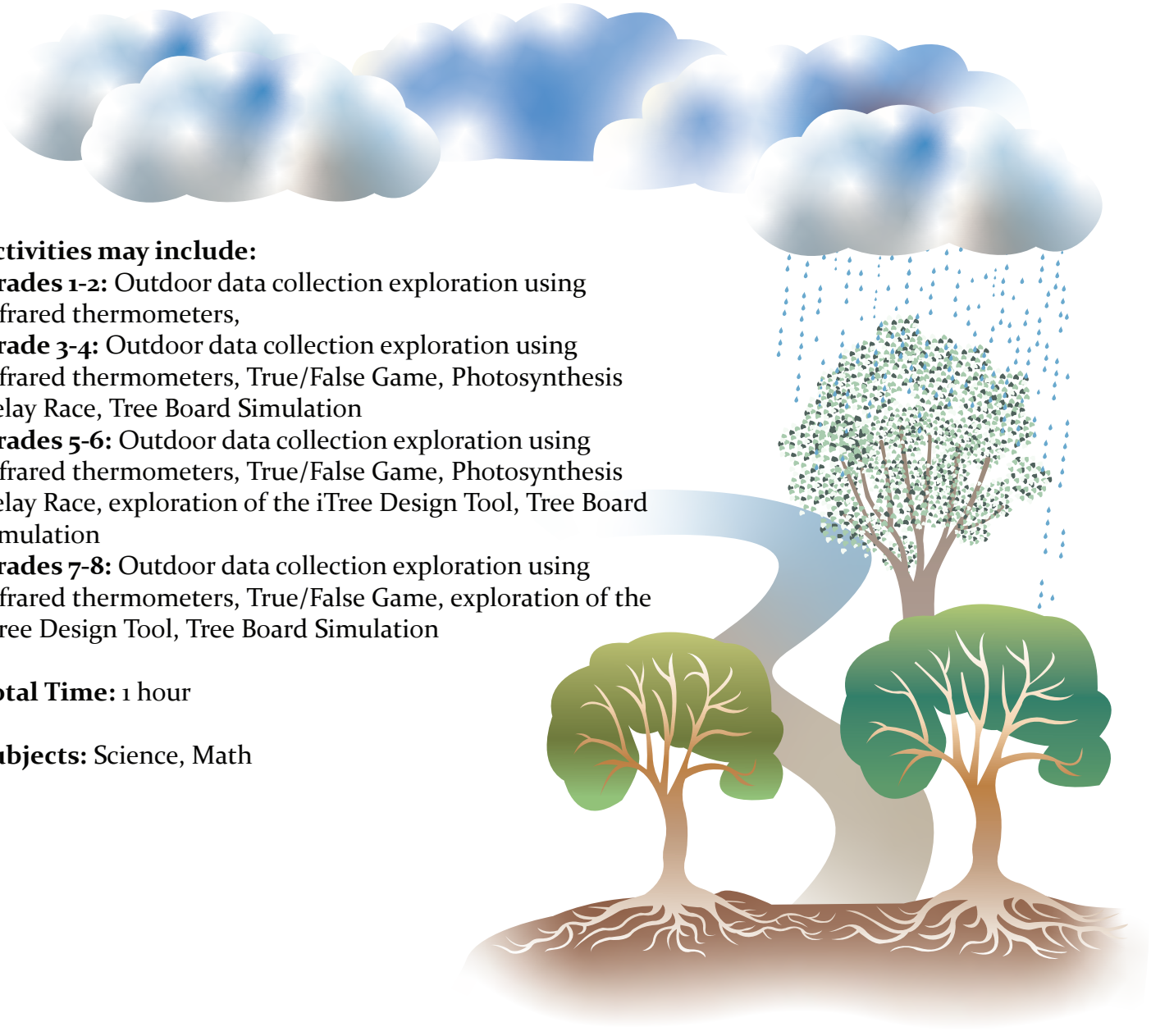
Four separate lessons may be conducted for each grade level: Community Benefits of Trees, Champion Trees as an Introduction to Citizen Science, Ecosystem Connections, and Creative Responses to Trees. It is recommended that these lessons are scheduled in order.

Community Benefits of Trees

Lesson Summary: Students will learn how trees help to cool the environment, provide habitat for wildlife, reduce air pollution, reduce energy costs, help prevent erosion, contribute to human health and well-being, and so much more.

It is known that patients in the hospital recover faster when they can simply see a tree from their hospital room window, and the very act of planting and caring for trees may boost mental and physical health! In this lesson we will discuss and debate these ideas and other current scientific research topics about trees. Depth and delivery of information covered will depend on grade level, and much of this lesson will be conducted outdoors when weather allows.

Outcomes: Students will have a greater understanding of how trees benefit communities, and will know of new ways to interact with and view their environment.



Activities may include:
Grades 1-2: Outdoor data collection exploration using infrared thermometers,
Grade 3-4: Outdoor data collection exploration using infrared thermometers, True/False Game, Photosynthesis Relay Race, Tree Board Simulation
Grades 5-6: Outdoor data collection exploration using infrared thermometers, True/False Game, Photosynthesis Relay Race, exploration of the iTree Design Tool, Tree Board Simulation
Grades 7-8: Outdoor data collection exploration using infrared thermometers, True/False Game, exploration of the iTree Design Tool, Tree Board Simulation

Total Time: 1 hour

Subjects: Science, Math

Champion Trees as an Introduction to Citizen Science

Lesson Summary: Anyone may participate in citizen science. In this lesson, students will learn what it means to be a citizen scientist and will be introduced to current scientific research projects that use data collected by the community. Focus will be on champion tree projects.

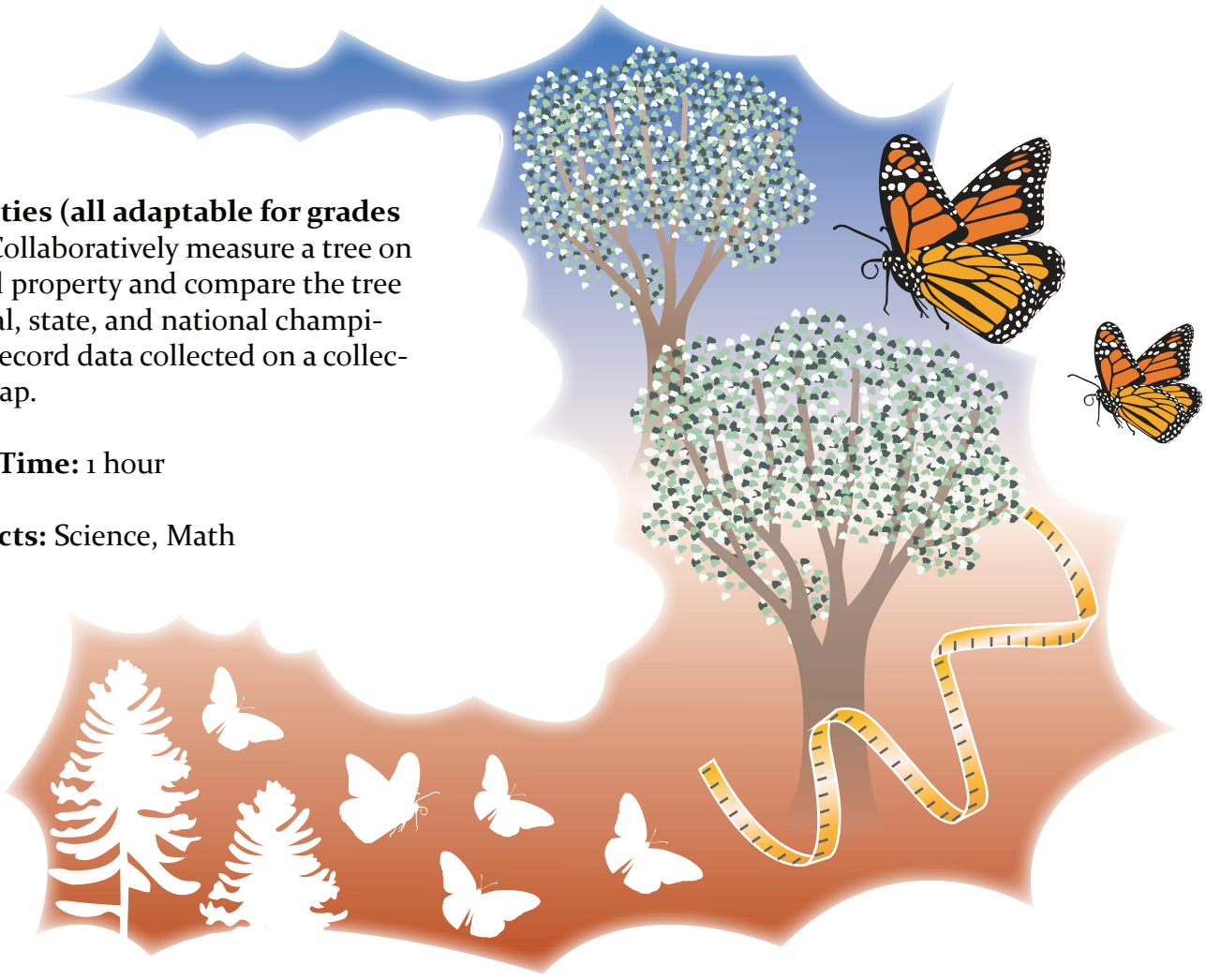
Teachers will be provided with supplemental information if they wish to continue the practice of citizen science in the classroom. Children have participated in other citizen science projects like monarch tagging, which helps scientists collect data regarding the monarch butterfly migration to and from the oyamel fir forests in Mexico. Data collected by citizen scientists is a valuable resource, and these projects empower citizens to be more engaged with the environment in which they live.

Outcomes: Students will understand what it means to be a citizen scientist, and will know of new ways to interact with and observe their environment.

Activities (all adaptable for grades 1-8): Collaboratively measure a tree on school property and compare the tree to local, state, and national champions. Record data collected on a collective map.

Total Time: 1 hour

Subjects: Science, Math

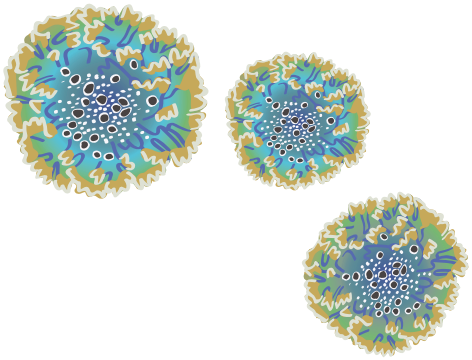


Ecosystem Connections

Lesson Summary: Trees are keystone species in terrestrial ecosystems. In this lesson, students will learn about many animals, mushrooms, lichen, and plants that are dependent on trees for survival.

For example, zebra swallowtail caterpillars can only eat the leaves of the paw paw tree, mammoths used to eat osage orange fruits, and there is something called the "ghost pipe" which has no chlorophyll but receives the nutrients it needs from trees via fungal networks! Much of the information will be delivered in the naturalist style with connections specific to the ecosystems of Kansas and Missouri. The delivery and depth of the information covered will depend on the grade level.

Outcomes: Students will have a greater understanding of interdependent relationships between species.



Activities may include:
Grades 1-2: Host Plant Scavenger Hunt, Branching Question Puzzle
Grades 3-4: Branching Question Puzzle, Nature Journaling to make observations of species connections
Grades 5-6: Nature Journaling to make observations of species connections
Grades 7-8: Nature Journaling to make observations of species connections

Total Time: 1 hour

Subjects: Science

Creative Responses to Trees

Lesson Summary: We will revisit what we learned in the first three lessons: Community Benefits of Trees, Champion Trees as an Introduction to Citizen Science, and Ecosystem Connections. While refreshing this material with a new perspective, we will respond to the information in creative ways.

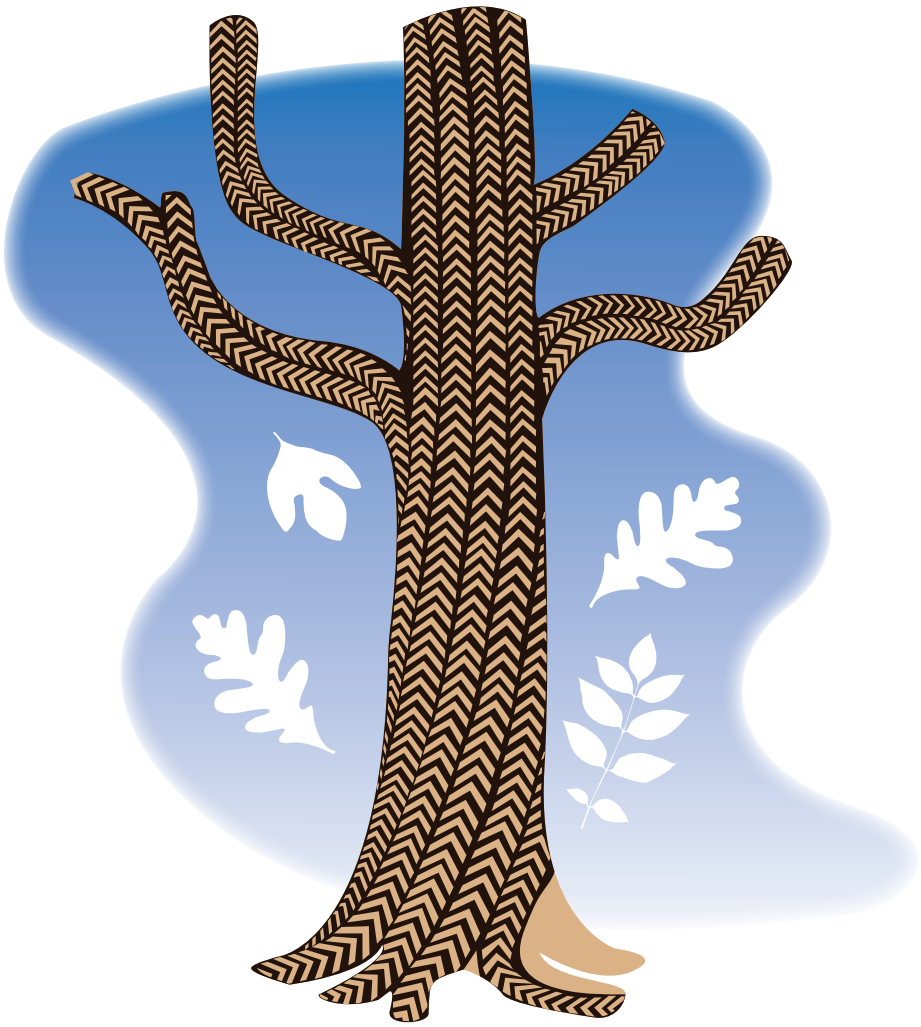
Students will use natural, gathered materials and photograms to create artwork. Photograms use light-sensitive materials to create monoprints; they are much like leaves in this way. We will also discuss and see images of artwork that artists have made in response to trees, including sculptures made for the Chicago Tree Project, for which, artists made artwork using in-situ rooted ash trees that have succumbed to emerald ash borer to draw attention to their plight. This lesson exists at the intersection of art and science. Depth of information covered will depend on grade level.

Outcomes: Students will develop critical thinking skills, and will have a better understanding of how art and science can intersect.

Activities (all adaptable for grades 1-8): foraging for natural materials, making photograms using gathered natural materials, leaf printing, collaging with natural materials

Total Time: 1.5 hours

Subjects: Science, Art



The curriculum of Trees are Terrific is guided by the Missouri State Science Standards and the Kansas-adopted Next Generation Science Standards, especially in regards to considering “the affective domain” and the interdisciplinary approach.

“The affective domain, the domain of learning that involves interests, experience and enthusiasm, is a critical component to science education” -NGSS

Please contact Heartland Tree Alliance with questions or if you would like to schedule a lesson: joe.wheelock@bridgingthegap.org