Using Technology to Connect Students & the Environment

Educator Toolkit

National Environmental Education Foundation
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Plugging into Nature with New Technologies

Students at IslesboroCentral School in Maine use a portable video camera to record their observations of wildlife.

"Digital tools and other technologies can serve as incredibly effective lures that draw students back out into the landscape - into their communities - and can provide an important bridge between the familiarity of the digital world and the discoveries that wait for them in nature."

David Munson
Education Director
Project Noah

Educators across the country are discovering that technology offers an exciting way to engage their students with the natural world. Mobile devices, digital cameras and other tools can help young people connect to the environment by equipping them to observe, collect and share data about local wildlife and habitats. As 21st century citizen scientists, students can contribute to conservation efforts, engage in environmental stewardship and understand the broader context of their work as part of a global community.

Using Technology to Connect Students & the Environment (http://bit.ly/13l0Gw3) illustrates how technology can further STEM learning through the environment, both in nature and in the classroom. The video demonstrates how the students of Islesboro Central School in Maine use technology to help document the ecological condition of nature preserves near their school. Islesboro, Maine is just one example of a school district using technology outdoors; educators across the country are harnessing student interest and skills in using technology as part of new creative strategies for engaging today's students in environmental learning.

In this toolkit, we outline activities and resources at all grade levels for implementing a similar project with your students centered on the theme of wildlife or habitat conservation. Whether your school has access to a park, school or community garden, nature preserve, local beach, field, stream or vacant lot, these spaces can serve as a resource for taking technology – and your classroom – outdoors, and encouraging interest in STEM and our environment.

Activities for all Grades

Backyard Science: Tallying Local Species to Learn About Diversity

The Learning Network
http://nyti.ms/IYna25

In this activity, students identify and record the number of species they find in a certain area and document their findings using digital cameras. Students can use smartphone apps and/or field guides to identify the plants and animals they discover and enrich the investigative process.

Citizen Science Scavenger Hunt

Project Noah
http://bit.ly/14xQ68b

During this lesson, students use Project Noah to interact with nature and technology as citizen scientists. Students search for specific organisms in the field, document their discoveries with digital cameras or smartphones and share their knowledge by uploading observations to the Project Noah site.

Monitor a Nest

Upland Hills School Bird Cam Crew
http://bit.ly/VKvoTb

This project engages students in learning about local birds using a video or surveillance camera to monitor a nest or bird box. Learn how to develop a nest-monitoring program by reading about the Bird Cam Crew at Upland Hills School in Oxford, Mich.

Technology Toolkit Key

A digital camera is needed for this activity.

A smartphone or tablet is needed for this activity.

A student at Islesboro Central School in Maine uses a smartphone to take a photo of wildlife.

Grades K-4

Discovering Our Blue Planet
Alaska Seas and Rivers Curriculum
http://bit.ly/W82R95

Students discover aquatic environments in their neighborhoods and in a field trip session. In these primary-grade activities, students utilize digital cameras to document their surroundings and help develop observational skills.

An Eye on the Garden
KidsGardening
http://bit.ly/XsGI6g

Students use digital cameras to capture changes in the schoolyard habitat and sharpen their observation skills. While taking an investigative look into the patterns and shapes of various botanical selections, students gain a new perspective to observe the garden.

Grades 5-8

Tree Tour
Project Noah
http://bit.ly/XUN7G5

Students use digital cameras and smartphones equipped with the Project Noah app to identify and map a variety of tree species. Whether in the schoolyard, park or forest, students use tech tools to create an informational Tree Tour for their peers and the community.

Wild Writing
Project Noah
http://bit.ly/WXkjzV

This cross-curricular activity incorporates tech-enhanced scientific observation and descriptive writing. At an outdoor area near or on school grounds, students use digital cameras or mobile devices to photograph an organism of their choice. Students then brainstorm adjectives and write rich descriptions of their organisms and the habitat and finish by adding their observation to the Project Noah site.

Grades 9-12

Pool Monitor
Project Noah
http://bit.ly/14xVpo9

Create a springtime Project Noah survey mission of a wetland habitat focused on aquatic insects and amphibians. Students document the wildlife they see with digital cameras or smartphones, take detailed notes describing each finding and later include their "spottings" on the Project Noah site. When possible, students may return to the field site multiple times during the season to capture life cycles and predator-prey relationships.

The Biological Line-up
Project Noah
http://bit.ly/YD1T4m

In this field investigation, students use transects and quadrats to assess the biodiversity of a certain area. Students survey species presence and abundance while employing digital cameras to record individual organisms; photos are accompanied by numbers identifying the position where the organism was discovered. In the process, students gain an appreciation for the diversity of life.

Suggested Apps for Connecting to the Natural World

Project Noah

Engage students in documenting local wildlife by uploading photos to Project Noah as part of a "mission". A global community can help I.D. their "spottings" which in turn can help scientists keep track of wildlife populations.

Journey North

Transform your students into citizen scientists by equipping them with this app which allows them to track wildlife migrations and seasonal changes in the environment around them.

What's Invasive

Engage students in a project to help scientists locate invasive species by making geo-tagged observations and taking photos in their local natural areas.

iNaturalist

Equip your students to record their observations of the natural world and share them with a social network for naturalists, potentially contributing to scientific research.

Creek Watch

Be stewards of your local watershed by using this app to snap photos of a local waterway and report how much water or trash there is. The app aggregates the data and shares it with local water agencies to help them track pollution and water resources.

Websites for Digital Exploration

BioBlitz Education
http://bit.ly/pdUCU0

Whether participating in a National Geographic/National Park Service BioBlitz (an event that brings together naturalists and citizen scientists, including students, to take a snapshot of an area's biodiversity) or a schoolyard bioblitz, the experience helps students study biodiversity firsthand with activities that support students to make observations, record data, understand classification and map their findings.

Encyclopedia of Life
http://bit.ly/6W4knP

Educators and students can work within the Encyclopedia of Life to create a collection of schoolyard bioblitz results, generate a field guide to share with the community, and listen to a collection of podcasts that will familiarize students with the diversity of life on Earth.

National Geographic FieldScope
http://bit.ly/xfTrgZ

National Geographic FieldScope is a web-based mapping, analysis, and collaboration tool designed to support geographic investigations and engage students as citizen scientists investigating real-world topics - both in the classroom and in outdoor education settings.

Field Guides for Outdoor Discovery

eNature FieldGuides
www.enature.com

This free, comprehensive site provides animal and plant field guides, "ZipGuides" that help you find wildlife based on zip code, mobile apps for iPhone and more.

Technology for Field Investigations: Scientist-Driven Technology Practices
http://bit.ly/ZuDR9w

Developed by the Pacific Education Institute for the Association of Fish and Wildlife Agencies' North American Conservation Education Strategy, this guide describes the technology used by natural resource professionals and available to K-12 students to conduct field investigations, problem solve through stewardship planning and projects and participate in outdoor recreation.

Tech Tools for Learning Outdoors

With easy access to the Internet, a camera and GPS, smartphones & tablets are powerful tools for outdoor study.

Apps can be downloaded to engage students in citizen science activities.

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