Exploring the Environment in Afterschool

March 29, 2018
Agenda

1. Housekeeping
2. Defining environmental education
3. Plum Landing
4. Cornell Lab of Ornithology
5. Science Action Club
6. Audience Q&A
Housekeeping

Experiencing delays? Close other programs.

Audio difficulties? Message us.

Question or comment? Interact in the chat box.
What is environmental science education?

And why is it important?
Environmental science education is...

the process of guiding students through asking, exploring, and answering questions about the world around them.
Why environmental science is great for afterschool

1. Nature is everywhere
2. Gets students outside and moving
3. Builds STEM skills and offers opportunities for hands-on science experiences
4. The possibilities are endless...
Speakers

Brianne Keith
Outreach Project Manager
WGBH Education

Laura Herszenhorn
Senior Manager
Science Action Club

Kelly Schaeffer
Education Specialist
Cornell Lab of Ornithology

Leah Silverberg
Research Assistant
Afterschool Alliance
PLUM LANDING
The PLUM Crew
Introduction to PLUM LANDING
Overview of PLUM LANDING

“Just did a great lesson from your website with 40 kids in third and fourth grade... they asked if they could watch more episodes and loved building watersheds! Thanks Plum!”
– Afterschool Educator in Missouri

“The interactive games are fantastic because they encourage students to problem solve. I love the science vocabulary words that are an integral part of the game format.”
– Technology Teacher in Louisiana
What We Learned

Effective programming will:

(1) Increase **access** to science learning opportunities
(2) Optimize **time and space** available for outdoor exploration
(3) **Prepare** educators and parents to lead science activities
(4) Support the **priorities** of families and education programs
(5) Help ensure **safety**
(6) Use **technology** in appropriate and meaningful ways
New Toolkit

**Themes: Water, Weather, Plants, Animals**

- Animations
- Hands-on science activities
- Family tip sheets
- New app
- Educator videos
- Parent videos
- Toolkit
- Promotional materials
Animated Webisodes

- 12 new animations exploring nature in a fictional mid-Atlantic city
- Address environmental concepts and feature wildlife and natural phenomena relating to the city
Hands-On Science Activities

Animal-ympics

What Is This Activity?

How do animals' movements help them survive?

Kids compete in a series of events to compare their movements to those of city animals and then play a game to model how traffic can impact animal lives.

Learning Goals

Big Science Idea:
- Animals move in different ways from one place to another to find food, water, and shelter, and to avoid danger.

Skills kids will use to investigate the ideas:
- Model various ways that animals move
- Use math to estimate, measure, and compare distances and/or speeds
- Communicate the advantages of an animal's form of locomotion
- Model how traffic affects different animals on the move
- Make predictions and compare to actual time to travel a distance or number of flaps
- Communicate information about how locomotion helps city animals survive
- Design solutions to traffic accidents involving animals

How Do You Get Ready?

- Read the activity and gather the materials.
- You don't have to do all the activities if time is short. If there are two educators, split the group in half and run events simultaneously.
- Print the "Animal Fact Cards" on sturdy paper or cardstock, cut them out, and optionally laminate or secure them between pieces of clear contact paper or shipping tape.
- Scout out a suitable place such as a park, schoolyard, basketball court, or other open area. Mark off the boundaries of the playing area for the "Animal Crossing" game with chalk, string, or yarn.
- Troubleshoot any safety concerns (traffic, poison ivy, sharp objects, etc.).
- Mark out a starting line at the edge of the area with chalk, ribbon, or yarn. It should be long enough for all the kids to line up behind it. Measure out 1 yard and mark it off the full length of the starting line. Then, measure out 40 inches from the starting line and mark that distance with a 4-foot line.
- Cut an 80-foot piece of string, ribbon, or yarn.

In English & Spanish

- 8 afterschool
- 8 family-facilitated
- 10 self-guided
- 4 take-homes

Curriculum Topics

- animals
- outdoor (fair weather)

Group Size

- whole group

Activity Time

- 60 minutes

Materials

- Whistle
- Notebooks and pencils (per kid)
- Measuring tape or yardstick
- Ribbons, string, yarn, or chalk (to mark start and finish lines)
- 80 feet of ribbons, string, or yarn
- Timer or watch
- "Animal Fact Cards" handout (provided)
- Optional: Piece of chalk for each kid
- Optional: Clear contact paper or shipping tape
- Optional: "Videos about Exploring Outdoors" handout
- Optional: "Explore Animals Around You" handout

SECRET WORD

Speed

Tell kids: Anytime I hear today's secret word, I will blow the whistle and you must immediately stop what you are doing and do five frog hops (demonstrate). Don't tell kids the secret word! Challenge them to figure it out.
Activity & Media

Thematic sequences that pair activities + media for turnkey programming

- **Afterschool**: 1 hour of programming (8 pathways)
- **Club**: 5 days x 1 hr of programming (2 pathways)
- **Camp**: 5 days x 3 hrs of programming (1 pathway)
Parent Videos

- Hosted by Rue Mapp of Outdoor Afro and José González of Latino Outdoors
- Address common barriers urban families face

*In English & Spanish*
Get Outdoors with Your Family—and Sneak in Some Science, Too!

You don’t need to be a hiker to get outdoors and explore with your family, and there’s no need to make a special trip to find nature—you’ll find it right out your front door, from the red-tailed hawks patrolling the city to the dandelions poking through cracks in the sidewalks. Step outdoors, look around, ask a few questions, and let your child take the lead.

Walk and talk.
Take a stroll and talk about the plants and animals that call your neighborhood home. Where do the squirrels find food? Where do they sleep? How far do a bird’s roots reach?

Do you need to have answers. Science is about asking questions, wondering, and exploring your ideas. Let your child ask and let you be curious. Ask questions starting with “Why...?” “How...?” “What...?” These types of questions promote scientific thinking and reasoning.

Learn Science and Respect Nature
Kids who spend time exploring nature outdoors:
• Observe it in school, especially science.
• Feel more connected to plants and animals.
• Understand the need to take care of the planet.
• Want to keep learning, exploring, and asking questions.

Boost Mental and Physical Health
Research shows that regularly doing outdoor activities:
• Improves motor skills—how well children move.
• Increases fitness and reduces extra weight.
• Reduces stress, anxiety, and lowers stress.
• Strengthens the body’s ability to fight disease.
• Makes children feel positive about the future and themselves.
• Stimulates creativity and the imagination.
• Often carries into adulthood as a healthy habit.

Any Obstacles?
We live in the city.
Perfect: Every city, suburb, or town is part of a larger ecosystem—a one-of-a-kind place where both plants and animals (including humans) live together. You don’t even need to go beyond your neighborhood. There’s far more nature around you than you might realize.

I have little or no time.
It pays to make time, given all the benefits you and your child talked about. One way is to add easy outdoor mini-games to your daily routine. Try this: Can you and your child walk to the bus while counting all the animals you see? How about back home again—how many different types of flowers do you see?

Citizen Science
What Are These Activities?
Scientists rely on data from people all over the country who report on local animals, plants, weather, and water. They use the data to answer important scientific questions about the environment. Here are some easy projects for you and your child to do, though you’ll need internet access.

Do an online search for the organizations and/or key terms.

Animals
Squirrel (year-round)
Have you ever seen a rare black squirrel? If so, report it! Why?
Scientists think most squirrels were black 150 years ago. So they wonder:
Why are squirrels today mostly grey and black squirrels rare?

Celebrate Urban Birds and Other Bird Projects (year-round)
The Cornell Lab of Ornithology and the National Audubon Society have asked citizens to spot and count birds since 2002. Why? Populations might be in danger due to changes in the climate. Families in cities and towns big or small can join Celebrate Urban Birds, a program with a free activity and information kit to download. The menu in the upper-right corner of the website has links to other bird projects.

Background Beetle (spring and summer)
Build a simple trap to lure these common beetles and then send the dead bugs to scientists. Why? Because some beetles destroy whole forests and fruit crops. Scientists want to know where they live.

Urban Buzz (summer)
Cicadas are insects that buzz loudly from the trees to attract mates, after which they die. This project asks people in cities and towns to collect a few dead bugs and mail them to scientists. Why? They want to know if cicadas in populated areas are suffering from a lack of trees, heat, or pollution.

Plants
Project BudBurst (year-round)
Do you live where there are four different seasons? Scientists want to know when your trees leave bud in spring, when flowers bloom, when fruit or nuts appear, and when leaves change color in the fall. Why? They wonder if the timing of these things is changing because of the warming climate. Changes would affect the animals that rely on these plants for food.
Educator Training Videos

- Hosted by Jessie Scott, USFS Urban Connections Program
- Address common challenges outdoor educators face
Digital Badging System

Outdoor Adventures

- Virtual badging program
- 12 new online missions
- Design to be feasible in urban environments
- Explore animals, plants, water, and weather phenomena
Outdoor Family Fun with Plum App

- 5 new missions every day
- Missions use camera, counter, or checklist
- Tips and discussion prompts
- Rewards encourage families to persist
Guidance for Program Directors

- Guide with tips, planning advice, and more
- Suggestions for using materials in different types of programming
Bringing PLUM to afterschool
PLUM-themed field trips
Stay in Touch!

Brianne Keith
Outreach Manager
Brianne_keith@wgbh.org

Main page:
http://pbskids.org/plumlanding/

Toolkit:
http://pbskids.org/plumlanding/educators/toolkit.html
Our mission:
To interpret and conserve the earth's biological diversity through research, education, and citizen science focused on birds.
BirdSleuth K-12 Mission

To create innovative resources and training that build science skills while inspiring young people to connect to local habitats, explore biodiversity, and engage in citizen-science projects.

Twitter: @birdsleuth
Facebook: BirdSleuth
Email: birdsleuth@cornell.edu
Website: www.birdsleuth.org
BirdSleuth K-12 helps educators bring the power and engagement of citizen science and inquiry to their students
BirdSleuth K-12 Outreach

Curriculum Resources
kits & free downloads

Educator Training
online & in person
Nature Connection

Citizen Science

Inquiry
Projects in which volunteers partner with scientists to answer real-world questions.
In citizen science, people everywhere report observations of natural events using basic, scientific protocols.

295 million observations submitted
21.7 million checklists entered
279,000 participants
10,226 species
Every country in the world
Over 2 million locations
Your Counts Really Matter!
CLO Citizen Science Projects

1. Identify and observe birds
2. Collect data
3. Enter data online
4. Retrieve and view online data
The SCIENCE PROCESS:
What will YOU Discover?

1. Make observations
2. Pose questions
3. Form a hypothesis
4. Design an experiment
5. Collect and analyze data
6. Look at references
7. Draw conclusions
8. Share results
“I learned that taking them outside and letting them do bird observation was a great way to motivate them to ask questions in science.”
Inquiry...

- Asking and answering own questions (authenticity)
- Includes “project-based learning”
- In NGSS, is inherent in “science practices”
Investigating Evidence

Unit Timeline: 1 week, a semester, or a year-long project... it's up to you and your students!

- Observe and Wonder
- What is Science?
- My Investigation
  - Testing Hypotheses
  - Show Me the Data
  - Share My Investigation
Variables in Science Experiments

What makes an experiment “fair”?

Investigating Evidence

Kinds of Questions

You may have already come up with some questions about your observations. Different types of questions lead to different types of research projects. You can classify questions by how you can answer them. This graphic shows four ways to answer your scientific questions.

WHAT DO YOU THINK?

Look at the graphic and read the paragraph in the box below. What are the four ways to answer your scientific questions?

WHERE WILL YOU JUMP INTO THE PROCESS?

Depending on your question, you can enter the process of science at different stages. Look at the dotted arrows to see where this student scientist could jump into the scientific process. Some conduct their investigations through experimental or observational studies, some start by exploring and analyzing data from a database (like eBird, for example), and still others find answers by pulling together information they find in reference materials such as books or web sites.

Data

Answer your question

Share findings

Reference materials

Conduct

Conduct

Explore and analyze

Read, then draw conclusions about
Online Professional Development

academy.allaboutbirds.org/integrating-inquiry/
Do Citizen Science and Inquiry Work?

Efficacy of Science Inquiry Practices
(N=139; Range 0-3)
p-value <.0001

Students also showed an overall more positive attitude toward science and nature.

• I like to identify things in nature. (p=.005)
• I like talking about science with others. (p=.001)
• Kids can collect data that scientists can use. (p=.0001)
Keep in touch!

Twitter: @birdsleuth
Facebook: BirdSleuth
Email: birdsleuth@cornell.edu
Website: www.birdsleuth.org
Science Action Club

Laura Herszenhorn
California Academy of Sciences
lherszenhorn@calacademy.org
Explore, explain, sustain
Professional development, curricula, kits

Birds Scouts
Bug Safari
Cloud Quest
Ignite curiosity, build skills, develop STEM identities.
Long term projects, global access, ease-of-use
Impacts and Outcomes

15,000 youth
1,600 educators
750 clubs in 21 states
200 eBird checklists
1,395 iNat observations
Impacts and Outcomes

Increased youth interest, engagement, value of STEM

89% I understand the activities we do in SAC

84% Being in SAC makes me want to learn more about science

85% Learning about science can help me to better understand the natural world

82% SAC makes science more fun
Impacts and Outcomes

Educators feel confident, prepared, inspired

100% I feel able to help youth connect with the natural world

97% I learned new science skills and concepts during trainings

97% I learned useful teaching strategies

99% I want to learn more about science and nature
In their own words...

Citizen science develops STEM identity and promotes critical thinking

Citizen science is a great way for students to see themselves in a different role within their community. When students are able to conduct research, collect specimens or data, learn to use scientific tools, and share their findings with others, they develop a sense of ownership and responsibility for their environment. As they start to ask critical thinking questions and connect their findings to real world experiences, they realize that they are part of a bigger picture and that one person really can make a difference and influence others. What an amazing and powerful gift we can give our youth! - YMCA Program Director, Anaheim, CA
Brianne Keith
WGBH Education

Kelly Schaeffer
Cornell Lab of Ornithology

Laura Herszenhorn
Science Action Club

Audience Q&A
Thank you!

Questions: Email Isilverberg@afterschoolalliance.org