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Animal Tracks Urban Communities Action Pack

Sara Bradley

Cathy McFarlane Nolan

Cheryl Dixon

Elenor Hodges

Charles Wilkinson

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Follow the
Tracks...

*Animal
Tracks*[®]

Urban
Action Pack



200
GC
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1997



Animal Tracks®
URBAN COMMUNITIES
Action Pack

1/21/97

NSLC
c/o ETR Associates
4 Carbonero Way
Scotts Valley, CA 95067

Animal Tracks® Urban Action Pack

Written by Sara Bradley and Cathy McFarlane Nolan

Contributions by Cheryl Dixon and Elenor Hodges

Edited by Charles Wilkinson

Cover Design by Jeffrey Hutman - Kokopelli™ Design

Kids' Page Spanish translation by Estrella Triana

The **National Wildlife Federation** (NWF) unites people of all walks of life to conserve our land, water, and wildlife in our own communities and around the world. Since its beginning in 1936, NWF has believed that educating people about conservation is the best way to get them to practice it. We act on this belief with programs that make conservation understandable and accessible to all.

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National Wildlife Federation
8925 Leesburg Pike
Vienna, VA 22184

Mark Van Putten, President and CEO
Stewart J. Hudson, Vice President, Educational Outreach
Margaret Tunstall, Director, Classroom-Related Programs Division
Elenor Hodges, Animal Tracks Senior Program Coordinator
Cheryl Dixon, Animal Tracks Training Coordinator
Sara Bradley, Animal Tracks Assistant Coordinator
Jennifer Kier, Classroom-Related Programs Administrative Assistant

Special thanks to: Sarah Bailey, Gerry Bishop, Erin Blackwood, Joe Dalrymple, Sara Griffen, Renee Haen, Windy Hodges, Sharon Levy, Bea McIntire, Jeanne McVey, Claire Miller, Glenn Nelson, Craig Tufts, Tara Wintermeyer, Beth Stout



People and Nature:
OUR FUTURE IS IN
THE BALANCE
NATIONAL WILDLIFE FEDERATION

CONTENTS



DISCOVERY

A Quick Look	1
Background	1



AWARENESS

This City is Unique	3
Critters Count	8
Pollution Plays	17
Construction Zone	26
<i>Animal Tracks Kids' Page</i>	31
<i>Animal Tracks Kids' Page in Spanish</i>	32



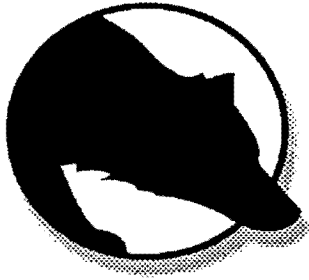
ACTION

Follow the Tracks to Action	33
How To Get Started	33
Project Ideas	34
Case Study: <i>Detroit Teens Restore a Wetland</i>	35



APPENDICES

Glossary	37
Guide To Activities	38
Resource List	40
Get Recognized!	44
Other NWF Education Programs	46



DISCOVERY

“ The city is a fact of nature, like a cave, a run of mackerel or an anthill. But it is also a conscious work of art, and it holds within its communal framework many simpler and more personal forms of art.”

- Lewis Mumford
The Culture of Cities

Discovery Notes...



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A QUICK LOOK

The city is our own unique habitat. In cities, hundreds of thousands or even millions of people live together in close proximity and share the same parks, stores, government, infrastructure -- waste disposal, transit systems, utilities -- and other services.

When a city is healthy, it is a symphony of systems flowing in and out of it, fueling and cleaning it as needed by the number of people (population) living there. Fuel -- energy in the form of food, electricity, water, gasoline, etc. -- is required in large amounts to serve all the people of the city. When this energy is used up, the resulting waste must be recycled, treated, or disposed.

Cities are also directly connected to all the inhabited areas and ecosystems surrounding them: suburbs, towns, rural areas, wilderness, and waterways. The careful balance of fueling and cleansing is difficult to maintain. Too much energy use or waste and the cities' processing plants aren't able to cope; then people and the environment are adversely affected.

A healthy city is one that grows and thrives at a rate which minimizes the loss of natural resources within it and outside it while improving the economic opportunity and quality of life for all the living things that depend on it. It is as close to a sustainable community as possible. As important as the environmental health of a city is, the economic health of the city is also crucial to its citizens, who depend on business and industry to provide needed jobs and growth. With careful city planning, our cities strive for a sustainable balance of growth and resources.

This Action Pack will help you answer the following Urban Community questions:

What is unique about the city?

What are the systems of the city?

What is the impact of cities as part of a larger ecosystem?

What types of wildlife are in the city?

What are the ways you and your students can help enhance the quality of life in your city?

BACKGROUND

People live in cities for many reasons. The diversity of the populations which make up the city also makes it a culturally rich environment with many different customs, foods, skills, and resources.

People share the convenience and efficiency of a wide range of opportunities and services. Jobs and businesses are centrally located, allowing people to easily get to where they work and to save time, energy, and expense.

City Systems

Every day, we depend on the availability of electricity, clean water, and food. Our cities and our body need fuel in the form of food every day. Where does our food come from? Rural areas support cities by growing and producing the food we eat. Food is transported to the cities by trucks, trains and ships. We buy the food at grocery stores and markets. As we prepare the food for our meals, we throw the packaging away. After we eat, our bodies process the food. Waste removal/treatment, water, and electricity are the biggest systems in a city. The efficiency of these systems directly effects our quality of life and the health of our environment.

Zones

Streets allow us to get from one place to another and they also divide the city up into sections -- shapes of land that have different uses determined by the city's planners and/or zoning board. Different areas are zoned residential (where people live), commercial (shops, businesses, malls, etc.), public (parks and recreation), or industrial (manufacturing) and light industry. The zones determine what can be built where. You might live in an apartment building where there are a lot of other apartment buildings and houses around, with a corner store, school, and library nearby. Your neighborhood is mostly residential sprinkled with businesses that service the people who live nearby.

The heart of all cities is industry. Your city's economy may depend on manufacturing, communications, government, entertainment, tourism, transportation, or many other products or services. The efficiency of this industry directly affects the people who live nearby and beyond. A city's industrial base is key in supplying jobs for the city's work force and keeping the city's economy healthy. However, industries produce waste as a result of doing business, and that waste must be disposed of in the least harmful way to those living nearby and also to those ecosystems touched by the city. If the waste is dumped untreated into a local waterway, the results are damaging to that waterway's ecosystem and to the people who depend on that water (or the water in that watershed.) Eventually, that water will become a pollution problem -- more difficult to treat for us to drink, and support less wildlife.

Wildlife in the City

Most of the animals found outside of the zoo in our cities are humans and their pet dogs and cats, but there are also a lot of wild species that call the city home. Gray squirrels, pigeons and a wide variety of trees and other plants are abundant in most cities. There are also birds, mammals such as raccoons, possum, rats, foxes, bats, reptiles such as snakes, frogs, turtles, toads, and lizards, and any number of insects. Cities with waterways are home to many types of aquatic wildlife. Many people would be surprised by the ways wildlife have been able to adapt to living in the city. Some cities with tall skyscrapers even have peregrine falcons who have adapted to this new urban environment by substituting high building ledges for their mountain aeries.

As more and more of our city green spaces are developed, the habitat for most of these animals diminishes, leaving them no place to live in our cities. More and more, people understand that having diversity of wildlife, even in the city, is valuable for all. They are saving places for wildlife and building habitats on school grounds and in other places to invite animals, native plants, butterflies, and other insects to find homes in the city.





Awareness

**“Teachers open the door, but you must
enter yourself”**

- Chinese Proverb

Awareness Notes...




A series of horizontal lines for writing notes, starting below the title and extending to the bottom of the page.



THIS CITY IS UNIQUE!

SUMMARY: Explore the history of your city through interviews and a writing exercise.

GRADE LEVEL: Grades 4-8

TIME : 2-3 class periods

SUBJECT: Social Studies, Language Arts, Geography, Art

MATERIALS: For a class of 30 students

- 6 pieces of white drawing paper (12"x18" or larger)
- Pencils, crayons, markers or colored pencils
- For each student: writing paper, 8 1/2"x11" drawing paper

Optional: Pictures from magazines or books of your city from previous years.

Handouts: 

- City History Interview (pp. 6-7)

LEARNING OBJECTIVES: Completing this activity will allow students to:

- ✓ Understand why cities developed in particular locations
- ✓ Research the history and characteristics of their city
- ✓ Compile a book on the uniqueness of their city

BACKGROUND:



Cities grow in a particular location for many different reasons, i.e. there might be water nearby or an important transportation route developing through the area. Chicago is located on Lake Michigan; New York City is located at the mouth of the Hudson River; Los Angeles sits on the coast of the Pacific Ocean. On the other hand, St. Louis developed as a start-up point for wagons heading west and as a link between the railroads and the Mississippi River.

However cities planned, whether organized beforehand (like Washington, DC) or haphazardly (like Boston), all cities have unique characteristics: New York City has its Central Park; Seattle has the Space Needle; Las Vegas is lit up by millions of lights; Hollywood is home to many movie stars; and Atlanta is the home of the Coca Cola company. Cities also have systems to keep them running and natural areas that serve as habitat for the local flora (plants) and fauna (animals). All cities are in a constant state of change as populations and opportunities grow and shift. As the populations of cities grow, citizens must become more aware of how their actions impact their city's health and start instituting individual changes to help improve that health.

This lesson helps students understand why cities grow in particular locations. Students will also be able to get a first-hand view of the characteristics of their city and an understanding of some of the changes that have taken place by interviewing adults who have lived in the city for a long period of time.

1.
2.
3.

PROCEDURE:

1. Conduct a brief brainstorming session with students to imagine what the countryside was like before your city began to grow. What are the unique characteristics that caused the city to develop here?
2. Divide students into groups of four or five. Hand out one 12"x18" piece of paper and drawing materials to each group.
3. Explain to students that as you will tell a story of the growth of a city, each group member, in turn, will add to the drawing illustrating each part of the story. To make this exercise more meaningful to the students, try to have it resemble the growth of your own city.

Develop your story so that each group member has a chance to add to the city at least two times. Have students complete the growth of their cities together by drawing in apartment buildings, more factories, a water treatment plant, skyscrapers, gas stations, more parks, etc. Below is an abbreviated example of a story and the instructions to students which can be used and altered to fit your city's history.

City Story Example

1. Hundreds of years ago a river flowed to the ocean. (First group member should draw a river and an ocean and pass the paper to the person on the right.)

2.- Some sailors were caught in a storm and sailed into the river for protection. It was a well protected spot, so they built a few houses. (2nd member draws houses and passes paper on.)



3. In the next few years, more people came up the river and built houses. (3rd member draws more houses and passes paper on.)

4. Stores and a bank were built. (Next member draws and passes it on.)

5. Roads leading from the village to other towns were built, as well as more houses. (Next member draws and passes it on.)

6. A factory was built along the river with houses nearby. (Next member draws and passes it on.)



7. A garbage dump began on the outskirts of the town. (Next member draws and passes it on.)

8. Six commercial buildings were built near the center of town and more houses were built. (Next member draws and passes it on.)

9. A large park developed on the river. (Next member draws and passes it on.)

10. Two more factories were built on the river along with more houses.

Etc.....

4. Guide your students through the completed city drawing, have the students show their illustrations, and discuss how and why it turned out the way it did.

5. For a homework assignment, pass out the handout, *City History Interview*. Find out if all students have someone to interview. Students should try to interview someone who has lived in the city at least 20 years. Possible people to interview include grandparents, neighbors, local business owners, and other family members. If there are students who have nobody to interview, enlist the help of your fellow teachers, school staff, and administrators to be interviewees. Another solution might be to invite senior citizens into your class or visit a senior citizens center.

6. After the students have completed their interviews, ask for 4-5 student volunteers to tell something they discovered from the interview assignment. Have the students write a story, based on their interviews, explaining what makes their city unique or special. Students can include an illustration or photograph if they choose.

7. Combine all students' papers and illustrations to create a book or bulletin board entitled "Why (insert your city's name) is Unique"



EXTENSIONS/MODIFICATIONS

- ❖ If overhead transparencies and projector are available, the opening activity can be done more quickly with the teacher telling the story of the city's development and drawing on the transparencies. Each addition to the city would be drawn on separate transparencies and overlaid on the previous transparency to the growth of the city.
- ❖ Have students find out about the areas in your city where the natural environment can be explored. Students can be split into groups to research different places in your city: zoos, parks, arboretums, aquaria, botanical gardens, and other interesting areas in your city. Publish this information in a booklet to be handed out to the parents of all students in the school.
- ❖ Ask a teacher or another adult who has lived in the city for many years to speak to your class about your city. Have students think up questions they would like to have them answer. The interview form used for the homework activity could be used with this guest speaker as well.
- ❖ Explore movies and books that are set in any historical period of your city. Research historical events at the library or city newspaper archives. Students could also write and produce their own video of the history of the city using the information they gather.
- ❖ Have the students brainstorm what the city will look like in 100 years and draw a mural or write a story describing their vision.

Awareness Notes...



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CITY HISTORY INTERVIEW

To the Person being Interviewed: This interview is being conducted to help the student learn more about your city's past and its uniqueness. The interviewer should ask the questions and write down your responses. Thanks for your help in this project!

Name of person interviewed _____

1. How long have you lived in the city?
2. Describe something that you really like about living in this city.
3. Describe your favorite memory of this city.
4. What jobs have you had in the city? What businesses and industries have been located in the city? Which ones stayed? How have the businesses benefitted the city over the years?

(Over)



5. How has the landscape changed over the years? How much bigger has the city grown? What natural areas are in the city and how have they changed over time?

6. What natural or man-made features of the city have disappeared or have been changed or replaced?


7. How did people get around in the city in the past? How has the transportation system changed? What impacts have these changes made on the area?

8. What changes would you like to see in your city in the next 5 years?

Critters Count

SUMMARY: Inventory and graph the wildlife that can be found in a small urban area and observe adaptations.

GRADE LEVEL: Grades 3-6

TIME : Two or three class periods

SUBJECTS: Math, Science, Environmental Studies


MATERIALS:

- Index cards or slips of reused paper approximately 3"x5" (one for each student with the name of a mammal, bird, amphibian/reptile, invertebrate, or plant that could be found in your urban area.)
- 7 category signs (one each with titles: Mammals, Birds, Amphibians, Reptiles, Invertebrates, Plants, and Fungi)
- 1 recycled plastic or paper bag for every two students

For each group of 5 students:

- 4 old pencils or sturdy sticks to use as stakes
- 1 yard stick (or meter stick, if using the metric system)
- 1 length of string, 14 feet long (4 ½ meters)
- 1 clipboards
- 1 magic marker
- Magnifying glasses, one per student

Optional: depending on students' graphing abilities: overhead projector and transparency of Wildlife Inventory Graph (or a large facsimile of the graph on the chalkboard)

Handouts: 

- *Wildlife Scavenger Hunt* (p. 13)
- *Wildlife Observation Sheet* (p. 14)
- *Wildlife Inventory Graph Example Page and Worksheet* (pp. 15-16)

LEARNING OBJECTIVES:

Completing this activity will allow students to:

- ✓ Discover what wildlife that might be found in an urban setting
- ✓ Observe, inventory, and graphically represent the wildlife found in an urban plot
- ✓ Develop and use new vocabulary words



BACKGROUND:

Although it is not always apparent, urban areas are teeming with both flora (plants) and fauna (animals). Take a look around and listen -- you will discover many species of birds and small mammals, a few larger mammals, some reptiles and amphibians if you look carefully, hordes of insects, invertebrates and lots of different species of fungi and other plants. With all the hustle and bustle in an urban setting, it is not surprising that the wildlife is often overlooked.

Biologists inventory wildlife in order to find out how many of a particular species are living in a particular area or to find out exactly which species are living in a particular area. By inventorying wildlife, biologists are able to see, for example, the impact of humans, as well as, weather and naturally occurring geologic phenomena, such as earthquakes and volcanoes, have on wildlife. The area that is studied could be as large as hundreds of square miles or as small as a square foot or even less, depending on the particular interests of the scientists.

The wildlife in a city have adapted to urban life. Some wildlife, such as the peregrine falcon, have learned to thrive in the city, much to the amazement of biologists. Other kinds of wildlife that have adapted extremely well are not nearly as welcome: rats and cockroaches, for example. The plant life in a city is abundant. Trees are the most obvious, but mosses, fungi and plants, both small and large, survive in the most unlikely places -- in sidewalk cracks, in abandoned lots, on the sides of buildings, and on rooftops.

This activity is designed to help students discover the abundance and diversity of wildlife in an urban setting.



PROCEDURE: Part I

1. Introduce vocabulary words *flora* and *fauna*.
2. Hand each student an index card with the name of an animal, plant or fungi that may be found in a city.
3. Place the seven signs in different places in the classroom. Ask students to examine the name on their card, determine to which of the five groups it belongs and then walk to the correct sign and stand by it.
4. As a large group, discuss where these plants and animals may be found. Show that all of these different species can be found in an urban location. Discuss signs of wildlife (seeing the wildlife with our eyes, finding other signs: tracks, *scat*, rubbings, fur, feathers, egg shells, signs of nibbling, nests or other animal homes, burrows). Discuss what wildlife and signs of wildlife the students think they might find on the school grounds. You may want to have examples to show the students.
5. Separate students into pairs. Pass out one copy of *Wildlife Scavenger Hunt* and one recycled bag to each pair. Explain directions carefully -- some scavenger hunt items may be collected, but others should not be taken from their location. Give 15 minutes for students to locate items.

6. Help each pair share its findings with the class. Point out that even on school grounds, we can find evidence of many kinds of wildlife. Discuss how factors such as weather, school site, time of day, soil conditions, and seasonality might affect their observations.



Part II

7. Explain to the class that they are going to conduct an inventory similar to real biologists to determine the abundance and diversity of wildlife on school grounds.

8. Divide class into groups with at least 5 students per group. Give each person in each group a job and explain each of these jobs to the students.

- ◆ Materials Manager - carries materials to the site, keeps track of them, and returns them
- ◆ Measurer - measures out the four sides of the plot,
- ◆ Stake Placer - works with the Measurer to place the stakes correctly,
- ◆ String Supervisor - marks the plot with the string, and
- ◆ Recorder - records data onto the handout Wildlife Observation Sheet).

Hand a bag of materials to the Materials Manager for each group and the clipboard with the observation sheet to each group's Recorder.

9. Lead students out to a vegetated area of the school grounds (chosen in advance). Demonstrate the measuring and staking of a plot enlisting the help of one of the groups.

Explain that the Stake Placer will place one stake in the ground. The Measurer will measure a 3 foot or one meter length of string and place one end of the string at the stake in the ground. (The measurer should not cut the string, but should mark the three foot spot with a magic marker.)

At the other end of the 3 foot measure, the Stake Placer will place another stake. The three foot string measure will be used to measure out the second side and another stake should be placed. The remaining two sides should be completed in this manner. When all four stakes have been placed, the String Supervisor should take the string, tie it onto one stake near the ground and wrap the string all the way around the plot, tying it off at the end.

Assist students in choosing a site, measuring and staking their plots. Encourage groups to choose a site that contains larger flora (trees or bushes for example).

10. The Materials Manager will hand out the magnifying glasses to all students and the students will observe their plots. The Recorder should write down the observations. Allow 10 minutes for observation. Encourage students to count the number of different types of plants, number of insects, number of signs of other types of wildlife, and the number of signs that humans have been in that area. If there is any litter in their plot, ask the students to pick it up after it has been counted and throw it away.

11. Gather all materials and return to the classroom. Discuss student observations. Were predictions correct? What surprised them? Where do these animals live? Can we figure out from our observations what they eat? How?

12. Pass out the Wildlife Inventory Graph, one per student. Discuss the missing parts of the graph (title, *x-axis* label, *y-axis* label and *legend*, if necessary) and fill in the blanks. Depending on the students' prior knowledge of graphs, you may choose to develop a graph on an overhead projector or on the chalkboard for the students to follow. Older students may be able to create the graphs entirely on their own.

13. When all have finished, discuss the results. Have any trends emerged? Was one category of flora and fauna more heavily represented than others? Why? Was another type underrepresented? Why?

14. To end the activity, define the word *adapt* and discuss the adaptations that wildlife has had to make to survive in the city. What species have adapted well? Why have they adapted? How are their needs fulfilled differently in the city than in a more rural setting?



EXTENSIONS/MODIFICATIONS:

- ❖ A simpler version of this activity would be to explore life in a sidewalk crack.
- ❖ For older students, the observations could be recorded over a period of time (from several days to weeks or months, or seasonally). Examine what causes the changes from day to day, week to week, month to month, or season to season. Results could be compared graphically.
- ❖ After observing wildlife at the original site, choose another site at which to repeat the inventory. Compare the findings.
- ❖ Take a wildlife census of a particular species. Using squirrels as an example, have each student locate a place for the center of their plot. They would sit in that location for a set period of time, i.e. 15 minutes. During that time, they will record the number of different squirrels they see. The numbers can be compared from different times of day or different locations on the schoolgrounds.
- ❖ Write technical reports on the observations the students made, or write imaginative stories from the point of view of an ant, gray squirrel, tree, toad, or seagull living in the city.
- ❖ If the school has a computer lab, older students could learn how to record data in a graphics or spreadsheet program and learn how to generate computer graphs.
- ❖ Use the data gathered by the different groups to calculate mean, median, and mode.

Extension: Tree Champion

❖ Do a “Tree Champion” measurement activity: measure the circumference of the trunk, estimate the height of the tree, and measure the crown spread of the branches. Add these together to find out how big a tree is overall (a short, wide tree may actually be “bigger” than a tall, narrow tree. To do this, follow these steps:



1) Measure the circumference of the trunk about 4 ½ feet above the ground level using a measuring tape. Record this measurement.

2) Have one person hold their arm out horizontally in front of them, fist at eye level. Record the distance between the eye and the fist. Face the tree whose height you want to measure. Hold a yardstick straight up and down at arm’s length in front of you, so that the distance from the fist to the top of the stick is the same distance as the distance you measured between the eye and the fist. Walk backward from the tree until you can see the base of the tree by looking over your fist, and the top of the tree by looking over the top of the yardstick. When you can see the tree completely by sighting over the top of the yardstick and the top of your fist, have another person measure the distance between you and the tree. This is the estimated height of the tree. Record this measurement.

3) Measure the crown spread by having one person find the branch that sticks out farthest from the trunk and stand under its tip. Have another person go to the opposite side of the tree and do the same. A third person should measure the distance between the two people. Record that measurement. Two or more students should repeat the process with the branch that sticks out the least. Add this measure to the widest spread measurement and average the two numbers. This is the approximate crown spread. Record this measurement.

4) Add the measurements together: the circumference of the trunk, the height, and the crown spread. (Remember to use the same unit of measurement.)

Try this activity with small groups. Have the groups compete to find the “biggest” tree.

(See *Smithsonian* magazine, November, 1996, issue for more information on Champion trees.)

Awareness Notes...



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WILDLIFE SCAVENGER HUNT

Your Names: _____ Date: _____

Directions: With your partner, try to find each of the items listed below. If the item has the word “Collect” in parentheses, you may put the item in your bag. If the item has the words “Write its location” in parentheses, write where you found the item, but do not remove it!

1. A blade of grass longer than your index finger. (Collect)
2. An acorn cap. (Collect)
3. A leaf on the ground. (Collect)
4. A pine cone. (Collect)
5. A few pine needles. (Collect)
6. A dead stick longer than your arm. (Collect)
7. Moss on the side of a building. (Describe and note the location)
8. Fungi. (Describe and note the location)
9. Signs of a spider or a spider itself. (Describe and note the location)
10. An ant hill.. (Describe and note the location)
11. Plants or insects in a sidewalk crack. (Describe and note the location)
12. Signs of birds or birds themselves. (Describe and note the location)
13. Signs of amphibians or reptiles or the animals themselves. (Describe and note the location)
14. Signs of mice, squirrels or other small animals or the animals themselves. (Describe and note the location)
15. Signs of larger mammals or the mammals themselves. (Describe and note the location)



WILDLIFE OBSERVATION SHEET

Recorder's Name: _____ Date/Time: _____

Team Member's Names: _____

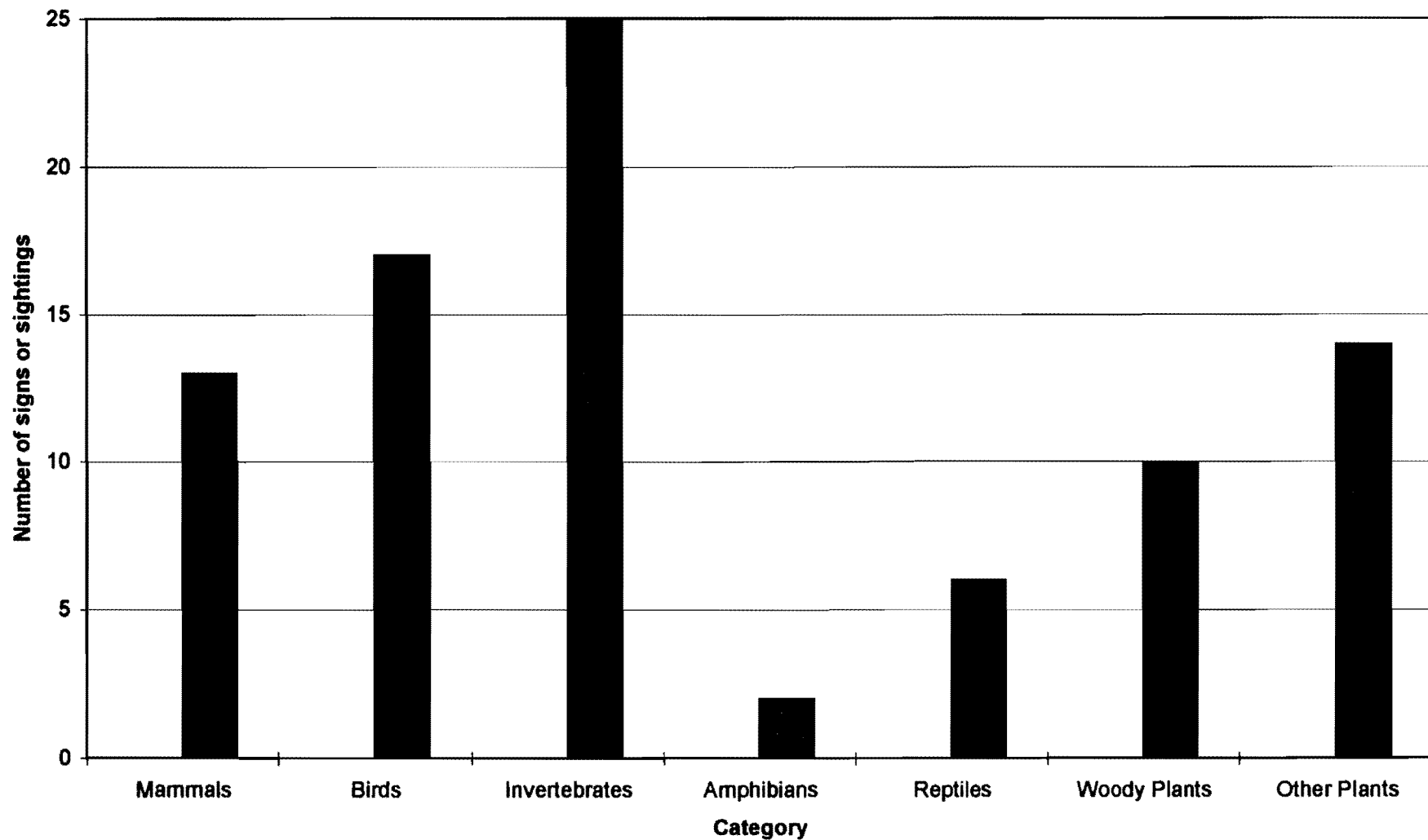
1. Describe the weather today _____
2. Describe the plot of land you chose (include plant life, grass, firmness of soil, nearness to buildings, etc....)

There are seven categories listed below. For each different plant or animal you see (or for signs of one), give one tally mark, then briefly describe it or draw what it looked like. Example:

CATEGORY	TALLY MARKS	DESCRIPTION
Example: Birds	///	1. small brown bird with white beak 2. woodpecker holes in tree 3. bird scat on ground
Mammals		
Birds		
Invertebrates (insects, slugs, spiders, etc.)		
Amphibians		
Reptiles		
Plants		
Fungi/Moss		
Other		

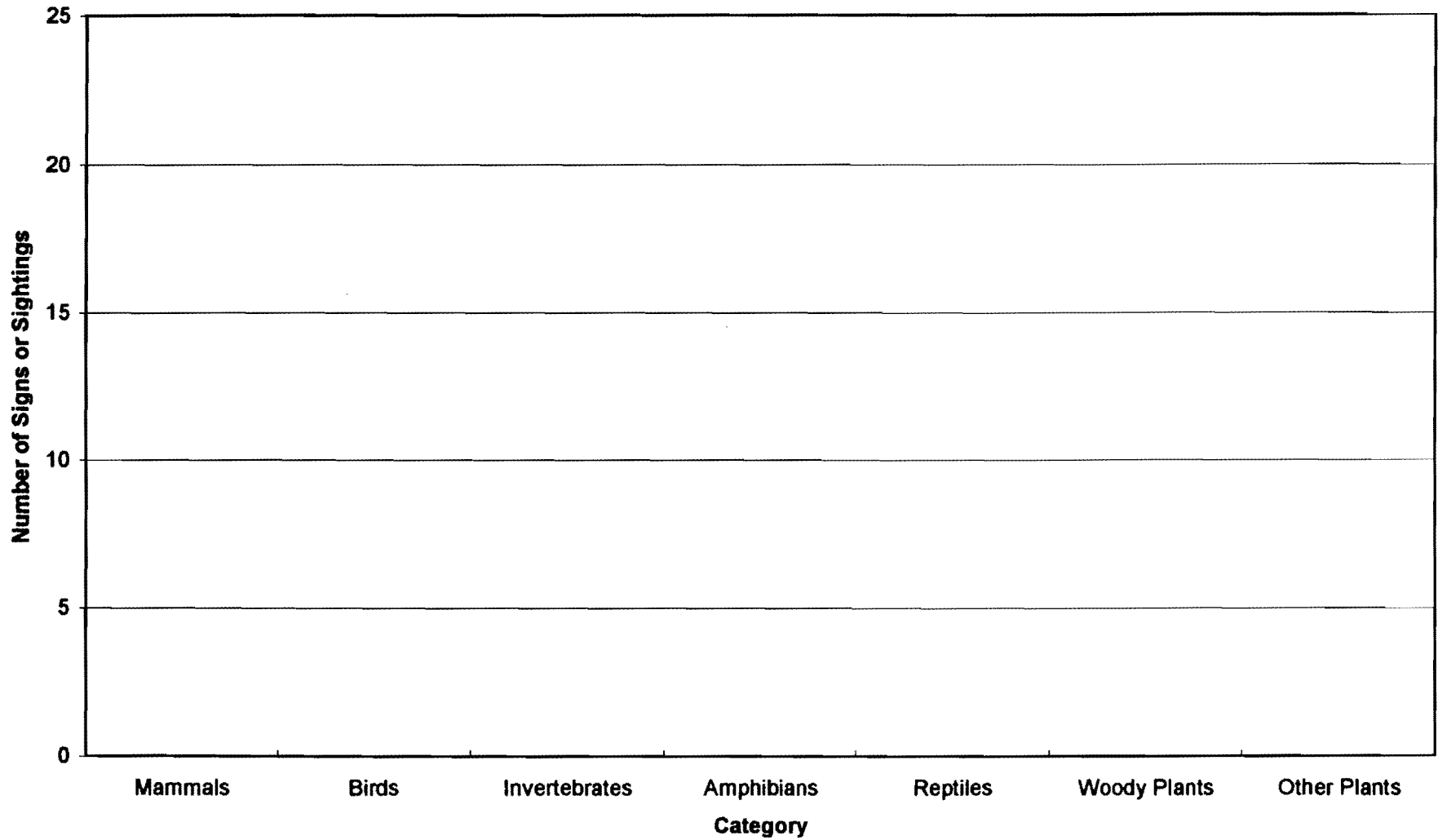


Wildlife Inventory Graph (Example)






Wildlife Inventory Graph (Worksheet)



Pollution Plays

SUMMARY: Find out information about causes of pollution and perform in skits to examine potential solutions.

GRADE LEVEL: Grades 4-8


TIME : 45-50 minutes

SUBJECTS: Science, Drama, Reading

MATERIALS:

- Chalkboard and chalk (or chart paper and markers)
- 6 pieces of chart paper and markers for each group

Optional: any props that might enhance the skits

Handouts: 

6 pollution problem and fact cards, one for each group (pp. 19-24)
Directions Worksheet (p. 25)

LEARNING OBJECTIVES: Completing this activity will allow students to:

- ✓ Understand how their individual actions (or those of their family members) may harm the environment.
- ✓ Use critical thinking skills to determine and act out solutions to pollution problems.
- ✓ Practice reducing, reusing, and recycling in the classroom.
- ✓ Develop and use new vocabulary words.



BACKGROUND:

Pollution is an unfortunate fact of life. City functions produce pollution with the large number of vehicles driving in and out of the city every day, humans going about their daily business, and factories spewing particulates into the air and water. Tackling and solving these problems might seem impossible to the average citizen -- adult or child. The solutions to these problems, however, start with the individual. If every individual made a conscious decision to adopt more “earth-friendly” habits such as reducing, reusing, and recycling their trash and belongings; taking public transportation or driving in carpools to work and school; and being careful to identify and dispose of hazardous materials properly, pollution problems would begin to diminish. Laws and improvements in pollution reduction technologies have reduced the amount of air and water pollution produced by factories. With the combined efforts of living and working more sustainably in the city, all citizens will reap the benefits.

Young people may feel powerless to change or improve situations. However, they are fully capable of learning how to change their habits and convince family members to change their habits as well. In order to adopt more sustainable and earth-friendly habits people need to know what to do and how to do it. This activity will illustrate to students how their actions or the actions of others may affect the environment negatively and what they, as individuals, can do to make their city more healthy.



PROCEDURE:

1. Ask students to think about their walk or ride to school. What kinds of pollution did they encounter? Record the answers on the chalkboard or on chart paper. Ask the students to look through the list to try and figure out if what they saw was air pollution, water or land pollution (trash, litter, dumping), noise or light pollution. Using colored chalk or markers, indicate the pollution type on the board or chart paper.

2. Split the class into six groups. Explain that they will be reading a card about a person who has a pollution problem, and then they will read 1 pollution fact card with factual information about that problem. Their job will be to brainstorm solutions to the problem and then, act out a skit in front of the class. Each skit will consist of two parts. The first part will illustrate the pollution problem. In the second part, the groups will show a possible solution.

3. Hand out a pair of cards (a pollution problem card and a pollution fact card) to each group.

4. Allow students 15-20 minutes to read the cards, brainstorm solutions, and prepare their skit.

5. After each skit, the actors in the skit should lead a discussion (with the teacher's help) to get the audience to identify the problem and solution. After the audience has guessed the problem and solution, each group should share their chart.

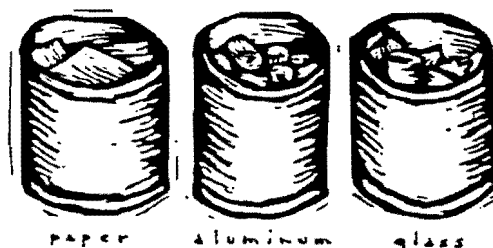
6. After all the groups have completed their skits, review all the pollution problems. Are there other problems where they live which should be included? What are some additional actions students could take to help diminish each pollution problem?



EXTENSIONS/MODIFICATIONS:

❖ Have each student write a short story about what the world would be like if no one tried to reduce one of the pollution problems presented in this activity. Afterwards read to the students "Wartville Wizards," by Don Madden, 1993, published by Simon and Schuster, Alladin Paperbacks (ISBN# 0-689-71667-2).

❖ Have the students pick one of the problems presented in the skits (or another problem) and change their actions to be part of the solution.





POLLUTION PROBLEM, CARD 1

Carl Cassidy is the school custodian. As you know, his job is to make sure the cafeteria, the halls and the classroom are tidy and clean. You sometimes see him in the hallway sweeping and cleaning up emergency messes. You can also find him in the cafeteria mopping and throwing away trash.

Kids at his school either bring their lunch to school or buy their lunch. Those who bring lunch bring cans of soda, juice boxes, sandwiches in plastic baggies, disposable napkins, and plastic forks and spoons. Those kids who buy lunch are served food on foam trays with plastic forks and spoons and plastic dishes. The five garbage cans are overflowing with all of the trash the kids throw out and Mr. Cassidy is exhausted from throwing out all the garbage.

POLLUTION FACTS, CARD 1

The issue: Americans generate a lot of waste -- more than 4 pounds per person per day! As more and more waste is generated, we need to come up with alternative ways to handle all of that waste. Waste can either go into landfills, into incinerators to be burned, or it can be recycled or reused.

What can you do? Think about your school and the cafeteria:

- ◆ How many kids buy lunch? How does your school serve food? In plastic packaging with throw away-trays?
 - ◆ Does your school use plastic forks and spoons? Plastic dishes? Styrofoam trays?
 - ◆ How many kids bring lunch from home? How is it packaged? Do kids bring reusable thermoses, reusable plastic containers, and cloth napkins?
 - ◆ Has the school set up recycling bins for aluminum, juice boxes, plastic containers, and glass?
-



POLLUTION PROBLEM, CARD 2

Pedro Pedagogue is a fifth grade teacher. Like almost all elementary school students, his students fill out worksheets, build models, create works of art, and generally use lots of supplies and paper in the classroom.

At the end of a every day, Mr. Pedagogue cleans up the classroom with several classroom helpers and they throw away stacks of leftover worksheets and tests, bits of construction paper, pieces of cardboard, and empty bottles from a science experiment. There is so much trash, he sometimes has to borrow another teacher's trash can. Mr. Pedagogue often looks at the trash and thinks to himself, "That's a lot of trash! I hate to throw it out, but what would I use it for?"

POLLUTION FACTS, CARD 2

The issue: Schools produce tons of paper trash everyday. Teachers hand out lots of worksheets, construction paper, and drawing paper everyday. After the paper is used once by a student, it is either thrown away or taken home. Eventually, all the paper ends up either in a landfill or in an incinerator to be burned, or it is recycled and reused.

What can you do? Think about how much paper you use:

- ◆ When paper goes home with you, what usually happens to it?
 - ◆ What happens to waste paper at school? Could the paper be used again? How might it be re-used?
 - ◆ Do your teachers use other supplies (like cardboard boxes, bottles, cans, index cards, old pencils, and crayons) besides paper? How might they be re-used?
 - ◆ Does your school have a paper recycling program?
 - ◆ Is the paper your school buys made from recycled fibers?
-



POLLUTION PROBLEM, CARD 3

Greta Grady and her friend Greg Griswold are wonderful artists. They used to draw and paint on large pieces of paper or canvases and they would show their artwork to their friends and family. After a while, they wanted more people to see their artwork.

Greta and Greg decide to use their artistic talents to spray-paint graffiti on the sides of buildings. While the two artists feel they are being creative, the building owners are angry and most neighbors and passers-by feel the graffiti is an eyesore. Greta and Greg feel bad that people are angry with them, but they want to be able to display their artwork.

POLLUTION FACTS, CARD 3

The issue: Graffiti can be found not only in urban areas, but in suburban and rural areas as well. Because of the larger population and the number of buildings, it seems to be far more prevalent in urban areas. To the graffiti artist, graffiti is beautiful artwork. To the person who owns the building and to neighbors and passers-by, it is often an unsightly destruction of property. The paint that is used is difficult to remove and cleaning often leaves a permanent scar on the building. Some graffiti is painted by violent gang members, which may encourage criminal activity in the area.

What can you do? Think about graffiti in your neighborhood or nearby.

- ◆ Where exactly is the graffiti?
 - ◆ What is the graffiti? Is it people's names? Gangs? Designs?
 - ◆ Who paints the graffiti? Are they from the neighborhood?
 - ◆ Why do you think they paint the graffiti there?
 - ◆ Where could they use their artistic skills better?
-



POLLUTION PROBLEM, CARD 4

Latonya Linley and her brother Leon walk home together after school every day. On their way home, they always stop at a convenience store to buy candy.

After Latonya and Leon rip off the candy wrappers, they toss the wrappers on the ground. They see no reason not to throw them on the ground because, litter is everywhere around the convenience store. It looks very ugly, but everyone does it. Anyway, there is no trash can to put it in.

POLLUTION FACTS, CARD 4

The Issue: Litter, which is caused by people who do not take the time to find a proper place to put their garbage, is very ugly and can be harmful to people and wildlife. Toxic chemicals, which can cause serious harm to people and wildlife, are dumped illegally on city streets or in nearby water. Plastic bags, if used improperly, can suffocate small children. Wildlife can swallow dangerous litter or get parts of their bodies caught on litter. For example, ducks and geese can get their necks stuck on plastic 6-pack holders.

What can you do? Think about your actions and the actions of those around you:

- ◆ Have you, your friends, or your family members ever thrown trash or garbage in the wrong place?
 - ◆ Why do you think people litter?
 - ◆ What do you think can be done to help people stop littering?
 - ◆ Imagine what your city would be like with no litter.
-



POLLUTION PROBLEM, CARD 5

Esmerelda Ellington lives in an apartment with her brother, sister, and mother.

If you walked into the Ellington house, you would notice that it is very noisy, very bright, and very warm. The Ellingtons have three televisions that they keep on all the time (they don't want to miss any good shows) and they keep their favorite music playing on the CD player all the time, too. The lights shine brightly in their house because they forget to turn off the lights in the rooms they are not using. Finally, the Ellingtons like to keep their house very warm during the day and at night. Esmerelda's mom gets very upset every time the electricity bill comes in the mail because it is always sky high.

POLLUTION FACTS, CARD 5

The issue: Electricity is a form of energy. It lights our houses, keeps our TVs and VCRs running, dries our hair, and sometimes heats our food and our houses. Electricity can be generated by the energy from flowing water or the shining sun or by burning fuels. The more electricity that people use, the more energy it takes to produce it. Because electricity is so easy to use, people in America use lots of it and many people use far more electricity than they need. Saving electricity will also save money by lowering electric bills.

What can you do? Think about how much electricity you use and what you can do to lower the amount of electricity you use.

- ◆ When you leave a room, do you turn out the lights? Do other people in your family turn off the lights?
 - ◆ Does the TV stay on in the house, even when nobody is watching?
 - ◆ Is the temperature in your house above 75° in the winter and below 75° in the summer?
 - ◆ Are all the appliances (hair dryers, curling irons, salad and vegetable shredders, electric knives, etc.) used in your house necessary?
-



POLLUTION PROBLEM, CARD 6

Ashley Boyle, a high school student, just learned from her mom how to change the oil and anti-freeze in her family's car. Ashley is saving her money to buy a car soon, and she asked her mom to help her learn how to take care of it.

After Ashley and her mom drain the old oil out of the engine and drain the radiator of its old anti-freeze, they get out the water hose to wash it all down the drain. Ashley asks her mom where the oil and anti-freeze will go, but her mom doesn't know. After they finish with the car, they start another project cleaning the garage and emptying all the opened cans of paint.

POLLUTION FACTS, CARD 6

The issue: The rain that falls on your street flows into a drain and then into a pipe that leads the water underground. Eventually, most of the water goes downhill to the nearest stream or river, and it keeps flowing downhill until it finds a lake, a bay, a reservoir, or an ocean. What if something poisonous to people and wildlife, like motor oil or anti-freeze, goes down the drain? It also ends up in a lake, in the bay, in the reservoir, or in the ocean.

The water that is on the earth now is the same water that has been on the earth since the beginning of time. There will never be new water on earth. This means that we need to take care of the water that is here and keep it as clean as possible.

What can you do? Think about the things you and your family might send down the drain:

- ◆ Have you or someone you know put fluids like oil, anti-freeze or paint down the storm drain?
 - ◆ Have you ever helped wash a car? Did you notice that the suds went down the drain? What happens if those suds are absorbed into the ground?
 - ◆ If somebody sprayed pesticides (to kill insects) or fertilizers (to help plants grow) and it rained right afterwards, where would the water run-off go?
 - ◆ What could be done to remind people not to pour hazardous materials down a drain?
-



POLLUTION: FROM PROBLEMS TO SOLUTIONS

Please follow the directions below. Check the blank when you have finished the task.

_____ 1. One group member should read the POLLUTION PROBLEM CARD aloud.

_____ 2. What is your character doing to cause pollution?

_____ 3. Another group member should read the POLLUTION FACTS CARD out loud.

_____ 4. Brainstorm together the possible solutions to the pollution problem. Write all of your ideas below. Be imaginative and creative.

_____ 5. Prepare your chart on chart paper. On the top, write "Pollution Problem" and describe in 2-3 sentences the problem that you read about. Below that, write "Pollution Solutions" and list your group's solutions. Write it so the whole class can see it and read it!

_____ 6. Prepare for the skit. Make sure each person has a role to play.

Feel free to make signs to state the problem, list some solutions, or make a name tag for your character. You may also make props.

Awareness Notes...




A series of horizontal lines for writing, consisting of 20 parallel lines spaced evenly down the page.



Construction Zone

SUMMARY: Discover the dependency and interconnectedness of all elements of a city and understand the need for zoning.


GRADE LEVEL: 4-8

TIME : 2 class periods

SUBJECT: Social Studies, Art, Geography

MATERIALS:

- Index cards or recycled 3"x5" slips of paper (one per student)
- Crayons, markers, or colored pencils for each student (red, blue, orange, green, brown/black)
- one heavy black marker
- scissors
- glue
- 1 roll of masking tape
- 1 plastic shower curtain or tarp
- Construction paper
- Empty food boxes (cereal, pasta, etc.), empty food and paper product cylinders (fruit juice concentrate, oatmeal, toilet paper rolls, egg cartons, etc.), pipe cleaners, craft sticks, fabric scraps, etc.

Handout: 

➤ *City Planning Grid* (p. 30)

LEARNING OBJECTIVES: Completing this activity will allow students to:

- ✓ Build a model of a well-planned city.
- ✓ Understand the elements needed to keep the inhabitants and business-owners in a city healthy, safe, and productive.

VOCABULARY: *residential, commercial, industrial, green spaces, institutional, zoning, density*



BACKGROUND:

The many different elements of a city are fully interconnected. Residential and commercial areas need to be close to one another, but not so close as to be bothersome. Industrial zones often need to be close to a water source and to transportation systems, but at a distance from residential and commercial areas. Fire stations, police stations, and hospitals need to be located strategically throughout the city for the safety of both people and property. City utilities (water treatment facilities, sewage treatment plants, incinerators, recycling centers, landfills, electricity plants) must be present to keep the city healthy and running smoothly. Finally, all people need the opportunity to escape to green areas and experience nature: parks, arboretums, zoos, and botanical gardens. Without any one of these elements, the city would be inconvenient and possibly even unhealthy or dangerous.

The placement of these elements of a city is controlled by a process called zoning. By zoning, city officials control the location of commercial, industrial, and residential areas. The process of zoning also controls the density of residential areas and determines how large an area the city can develop.

In this activity, students will be introduced to the concept of city planning. They will have the opportunity to build a 3-dimensional section of a city using set criteria, and they will combine their section with other sections to make one big city. The students will examine the whole city to determine if the city is a convenient and safe place to live.



TEACHER PREPARATION:

1. On index cards or slips of paper, write the names of the different elements of a city (see #1 under PROCEDURE.) Using the following key, write the elements of the city on the cards with the appropriate color marker:



residential areas: blue



commercial areas: orange



industrial areas: red



institutional: green

Make a sign or legend illustrating what each of the colors represents as a zoning area. This legend will be used throughout the lesson.

2. On the chalkboard or on a very large piece of paper, draw a grid similar to the one on the *City Planning Grid* handout, marking one axis with letters and the other with numbers (similar to a map). Make sure there are at least 30 spaces on the grid.

3. Using a heavy black marker, divide the plastic tarp or shower curtain into the same grid used on the chalkboard. Use a heavier line to divide the grid into four equal quadrants.



PROCEDURE:

1. Conduct a brainstorm session about what one might find in a city. Before concluding the session, be sure that students have named all components of a city (landfills or incinerators, hospitals, police and fire stations, hotels, restaurants, schools, libraries, power plants, reservoirs, parks, business buildings, different types of housing, sewage and water treatment plants, factories).

2. Hand out the index cards or recycled slips of paper with the name of one essential urban element written in the appropriate color on each.

3. Ask students to come to the grid on the chalkboard, one at a time, and tape their city element on it wherever they choose.

4. Discuss reasons why the students placed their elements in particular spots. Lead a discussion about urban planning and how it is used in a city. Discuss the types and characteristics of different zones on a city plan (residential, commercial, industrial, and institutional) and how location and density may apply to them. Using the brainstorm list, ask the students to determine which zoning area each element belongs to.

Using the index cards on the board as guides, ask the students to determine which zoning area the elements belong. List the different elements on the board in five color-coded columns (one each for residential, commercial, industrial, utility buildings, and green areas.)

Would a city zoning official be pleased with the city we just created? Why or why not?

5. Pass out crayons, markers, or colored pencils and the *City Planning Grid* handout. Show the teacher-drawn grid to students. Students will then color in the corresponding space on their handout using the appropriate color.

6. Break the class into 4 groups -- one each for the Northeast, Northwest, Southeast and Southwest quadrants of the city. Each group will have the opportunity to build its own quadrant of the city. Each quadrant may contain all four zoning types, as well as utilities, roads, and a river. All materials will be movable (buildings will be made from boxes, and roads or rivers will be made from construction paper).

7. Groups should first use the City Planning Grid to plan their quadrant's elements and to zone properly. Once they have planned, they may build their quadrant onto their section of the shower curtain or tarp.

Show the class the supplies it will be able to use (boxes, cylinders, construction paper, etc.) and encourage creativity in the design of the city.

8. After all groups have finished building and designing their quadrants, have all students gather around the city to study the city plan. Help students examine the city critically by asking questions, some of which may include:

Is anything missing? Are there enough hospitals, schools, libraries, police/fire stations? Is the industrial zone of one quadrant too close to a residential zone of another quadrant? Why are residential zones and commercial zones located in clusters? How could the city be improved? Could we move some of the sections around to make the city a better place to live? What factors influenced the location of industrial zones?

After the class has created a city that meets its zoning standards, the buildings and other elements may be glued or taped to the grid.

9. Hold a contest to come up with the most creative name for the city.



EXTENSIONS/MODIFICATIONS:

❖ Instead of building a 3-D model of a city, a simpler method would be to create a flat, cut-out version. Provide students with paper cut-outs of factories, houses, stores, apartment building, parks and other city elements. Glue these onto poster board or cardboard.

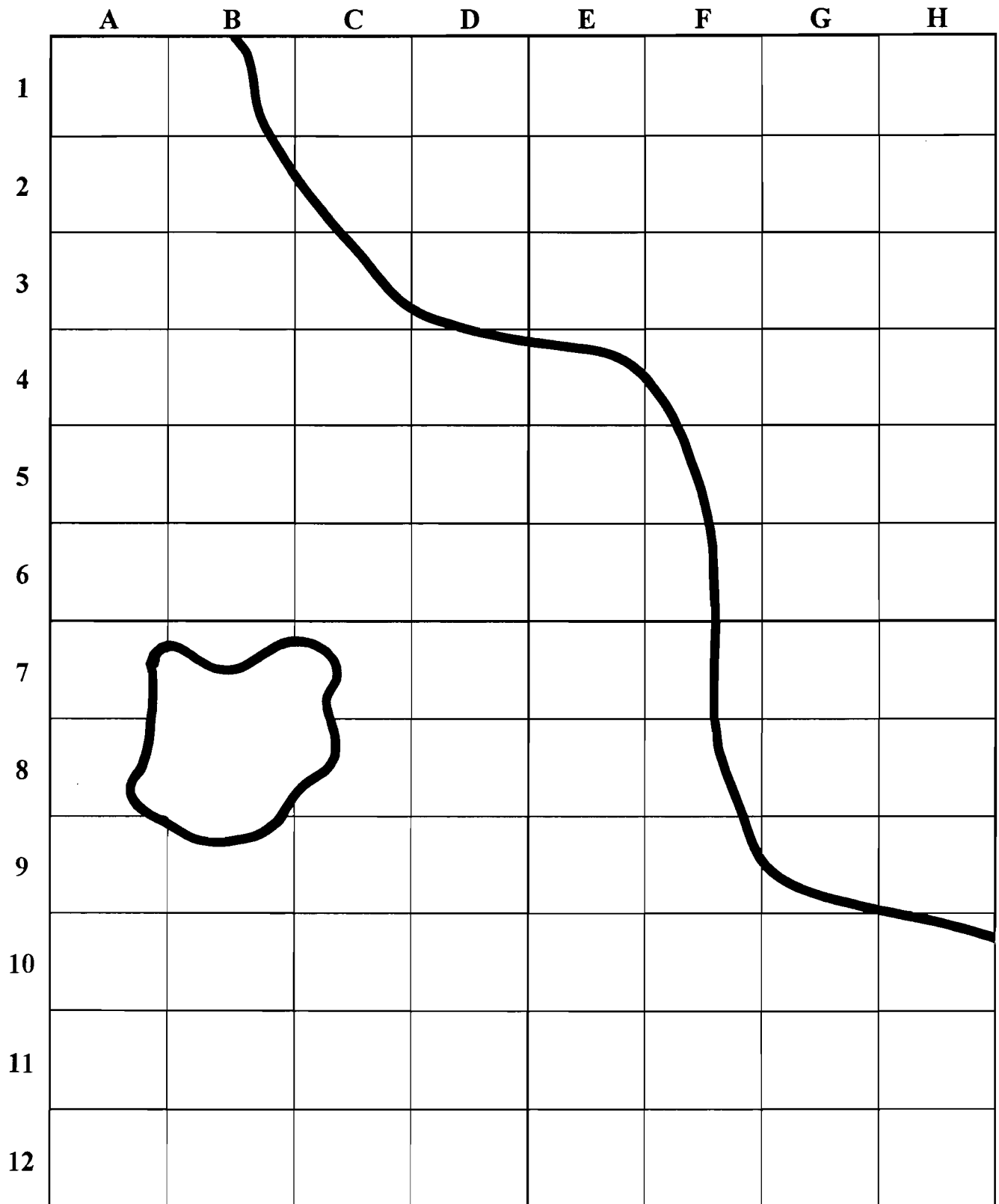
❖ Ask your local city planning office for a real land use planning map of your city (or a portion of your city) to show to the class at the beginning of the activity. Make copies of a portion of the map and have students find different elements of the city.

- ❖ Use the buildings in the city as part of a geometry lesson on perimeter, area, diameter, radius, and circumference.
- ❖ Design and write brochures or newspaper ads to “sell” the city to business owners, factory managers, and people who might consider moving there.
- ❖ If another class is building its own city, connect the cities together to create a larger city. Discuss the problems that might now exist among the eight different parts of the city.
- ❖ Invite a city planner to come in to school to discuss city planning. If the class’s city has already been built, ask the city planner to critique it.
- ❖ Have students plan a mass transportation system for the city they built or for the city in which they live.
- ❖ Plan for the growth of their city over the next 5, 10, or 20 years. For example, for every five years, add 100,000 people to the city’s population, 15 major businesses, 2 factories, 1 park and all the necessary utilities. Calculate the population in 20 years and figure out how many more businesses, factories, parks, etc. would be present in the city.
- ❖ Discuss how a city might grow if it were along a mountain range or along the ocean. Look at other cities in the world. How are they defined by their environments? How have they changed their environments?





City Planning Grid



Animal Tracks Kids' Page

Welcome to Animal Tracks!

Learn more about the environment and what you can do to make a difference,

“A city is a fact of nature, like a cave, a run of mackerel or an ant hill.”

- Lewis Mumford

Just follow the tracks...

Did You Know?

- Each person throws away an average of 4.6 pounds of garbage per day.
- The cockroach has been around since the time of dinosaurs, around 170 million years.
- A pair of robins usually has two broods of four birds each during a breeding season. In 10 years, if all the birds survived, the offspring of this one pair of robins would total 19,500,000 birds.
- One bat can eat up to 600 mosquitos an hour.
- One earthworm can digest 36 tons of soil in one year.

Wildlife in the City

Most of the wildlife found outside of the zoo in our cities are humans and their pet dogs and cats, but there are also a lot of wild species that call the city home. Brown squirrels, pigeons and a wide variety of trees and other plants are very abundant in most cities. There are also birds, raccoons, rats, foxes, bats and any number of insects. Cities with a waterway will find many types of aquatic wildlife. Many people would be surprised by the ways wildlife have been able to adapt to living in the city. Some cities with tall skyscrapers even have peregrine falcons who have adapted to this new urban environment by substituting high building ledges for their mountain aerie.

As more and more of our city greenspaces are developed, the habitat for most of these animals gets diminished leaving them no place to live in our cities. More and more, people understand that having a diversity of wildlife in the city is valuable for all. They are saving places for wildlife and building habitats on school grounds and other places to invite animals, native plants, butterflies and other insects to stay.

Unscramble the names below of wildlife that may live in a city ecosystem.

GNIPOE	EQIRSLUR	GRREEEINP OAFNCNL	ATB	HCKCACORO	PMAL E RTE	NOACRCO
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Things You Can Do !

- Reserve a place for wildlife at your home or school. Build a habitat on your school grounds or place a birdhouse on your balcony. Call NWF at 1-800-882-9919 and ask for more information about our Schoolyard Habitats program.
- Organize a neighborhood or school clean up day. Pick a spot that needs some help and pick up the litter you find there.

The new full-color Animal Tracks book contains more games, puzzles, information and activities about conservation issues. Order your copy from the National Wildlife Federation. Have an adult call 1-800-477-5560.

(Answers: PIGEON, SQUIRREL, PEREGRINE FALCON, BAT, COCKROACH, MAPLE TREE, RACCOON)

Animal Tracks Kids' Page

Bienvenidos a Animal Tracks (Huellas de los Animales)

Siga los pasos...

Aprenda más sobre el medio ambiente y cómo mejorarlo.

“Una ciudad es una obra de la naturaleza tal como una cueva o un hormiguero o una escuela de pescados.”

- Lewis Mumford

Just follow the tracks...

¿Sabe usted que?

- Cada persona elimina, por término medio, 4.6 libras de basura cada día.
- La cucaracha ha existido desde el tiempo de los dinosaurios, o sea más o menos por 170 millones de años.
- Una pareja de petirrojos tiene ocho pajaritos, o mejor dicho, cuatro pajaritos dos veces durante cada temporada. En diez años, si todos los pajaritos sobrevivieran, una pareja de petirrojos tendría 19,500,000 pajaritos.
- Una murciélago come hasta 600 mosquitos en una hora.
- Una gusano de tierra en un año puede digerir 60 toneladas de tierra.

La Flora y la Fauna Silvestre en la Ciudad

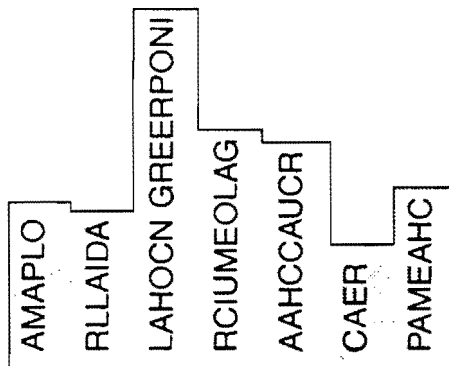
Fuera del zoológico, la mayoría de animales se encuentran en la ciudad que son los seres humanos y los animales domésticos tales como los perros y los gatos. Pero hay muchas especies salvajes que se han podido adaptar a la ciudad. En muchas ciudades existen grandes cantidades de ardillas carmelitas, palomas y árboles de diferentes variedades y muchos tipos de plantas. Hay también pájaros, mapaches, ratas, zorros, murciélagos y innumerable insectos. En algunas ciudades con vías de agua o canales se encuentran diferentes especies de plantas y animales acuáticos. A muchas personas les sorprendería ver cómo la flora y la fauna silvestres se han adaptado para vivir en la ciudad. En algunas ciudades que tiene edificios altos como los rascacielos existen halcones peregrinos. Los halcones se han adaptado al ambiente urbano usando las cornisas de los edificios en vez de las montañas para hacer sus nidos.

El desarrollo de nuestras ciudades requiere eliminar muchos lugares naturales para dar lugar a nuevo edificios. Así los nidos de los animales se han ido reduciendo hasta que llegará el día en que no tendrán ningún lugar para vivir en las ciudades. Hoy en día, un número cada vez mayor de personas, está consciente del valor que tiene para todos el que una ciudad tenga flora y fauna silvestre variada. Es por eso que se considera que hay que preservar los lugares naturales y construir viviendas para los animales de todas las especies.

Cosas que puede hacer

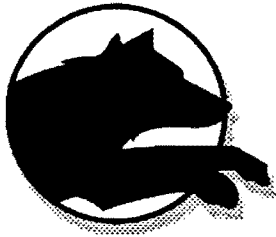
- Reservar un lugar en su casa o escuela para las plantas y los animales. Construir un albergue en el patio de su escuela o poner una jaula para pájaros en su balcón. Llamar a una organización como NWF a 1-800-882-9919 y pedir información sobre el medio ambiente.
- Organizar un día de limpieza en su barrio o su escuela. Escoger un lugar que necesita limpieza.

Todo Mezclado
Trate de formar nombres
de animales y plantas que se puedan
encontrar en su ciudad.



¡Ojo! En el libro nuevo de Animal Tracks, con ilustraciones en color, hay juegos, adivinanzas, información y actividades acerca de asuntos de conservación. Para obtener su copia un adulto puede llamar a National Wildlife Federation al 1-800-477-5560.

(Respuestas: PALOMA, ARDILLA, HALCON PEREGRINO, MURCIÉLAGO, CUCARACHA, ARCE, MAPACHE)



ACTION

“Never doubt that a small group of committed citizens can change the world: indeed, its the only thing that ever has.”

- Margaret Mead

Action Notes...





Follow the Tracks to Action...

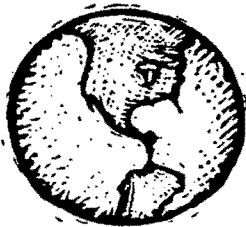
Engaging students in environmental action projects is a great way to become more active in the local community as well as to help students develop a connection with their natural world.

Determining what project to work on is often the hardest part. Involving students in the decision-making process will allow them to become invested in the project and to stay interested and committed.

Often it may seem overwhelming to take on a large, complicated project. However, most projects can be done at many levels, from changing one's own individual actions to involving the entire community in a unified effort. When evaluating each of the project ideas below, remember that they all can be modified to work for a class group, an entire school, or with the community at large.

7 Easy Steps to Action

- ✓ Research
- ✓ Brainstorm
- ✓ Evaluate
- ✓ Network
- ✓ Plan
- ✓ Keep Track
- ✓ Act



How to Get Started

Research: Conduct a little research to find out what's already happening in your community.

Brainstorm project ideas: Check out some ideas and resources that we've provided below. You can also go to the library or the Internet's World Wide Web to see what ideas you can get from other groups.

Evaluate options and select a project: Try to be reasonable—don't over-commit to a huge project. Take time to figure out what time and resources will be involved.

Network: Get other people involved. Try schools, youth clubs, community centers, local businesses, and churches. To get their interest, make a public service announcement, send out flyers, or attend community group meetings to present your ideas. Learn to delegate—those who share in efforts will also share in rewards.

Plan: If you fail to plan, you plan to fail—develop an action plan. Contact and involve the local government, community businesses, and other interested parties.

Keep Track: Take a notepad with you always and make sure to note important information like phone numbers, contact names, deadlines, and inquiries. Make sure to follow up on everything.

Act: Get started! Be patient, and remember that results and rewards take time.

Project Ideas

After you've done "The City is Unique" try.... City Festival

❖ Organize a community festival to celebrate the ways your city is unique. Hold the festival in one of your city's special outdoor places. Create flyers to highlight some of the hidden resources your city may have to offer, such as parks, trails, museums, recreation centers, and waterfronts. Work with government agencies and businesses to provide information on what's available for local residents. Communicate ways people can help keep your city beautiful with details about recycling centers, public transportation, and volunteer opportunities. Have fun and show off what you've learned about your city.

❖ To simplify this project, hold a festival just for your school or create a display with an illustrated map of your city, highlighting what is special about your city.

❖ Organizations that can help you include your city's visitor center, the parks and recreation department, and the community library.

After you've done "Critters Count" try... Save a Species

❖ Do research to learn which species are threatened and endangered in your area. Discover where these plants and animals live near you and help publicize the things people can do to help preserve that habitat. Many areas support unique species that can only live in a specialized habitat.

❖ To simplify this project, have your class adopt an endangered species. Many environmental organizations have adopt-a-species programs. Check out the resources section on p.40 for more information.

❖ Organizations that can help you include the U.S. Fish and Wildlife Service, biology departments at local colleges and universities, and the state environmental office.

After you've done "Construction Zone" try... Our City Plan

❖ Find a site that is being considered for new development or additional development and learn about the options they are considering. Write a plan of the way you would like the area to be developed, keeping in mind the way you want your community to grow. Present your ideas at a community planning meeting.

❖ To simplify this project, have your class write letters to local officials or planning board members with their views on how the city should grow and change.

❖ Organizations that can help you include the American Planning Association and the urban planning school at a local college or university.

After you've done "Pollution Plays" try.... Adopt a Park

- ❖ Pick a natural area in your city that your class can adopt. Organize a clean-up day to pick up litter and remove graffiti. Make the area a good place for people to enjoy nature by providing benches, trees for shade, and colorful flowers and plants. Try to enhance the area so that it will attract wildlife, making sure to consider food, water, shelter, and a place to raise young.
- ❖ To simplify this project, have students make earth pledges detailing how they are going to change their actions to help conserve resources.

❖ Organizations that can help you include local hardware and gardening stores and NWF's Schoolyard Habitats program, which provides a "How-To" planning guide and a pre-paid application for certification. See the Get Recognized section on p.40 for more information.

Case Study: Detroit Teens Restore a Wetland

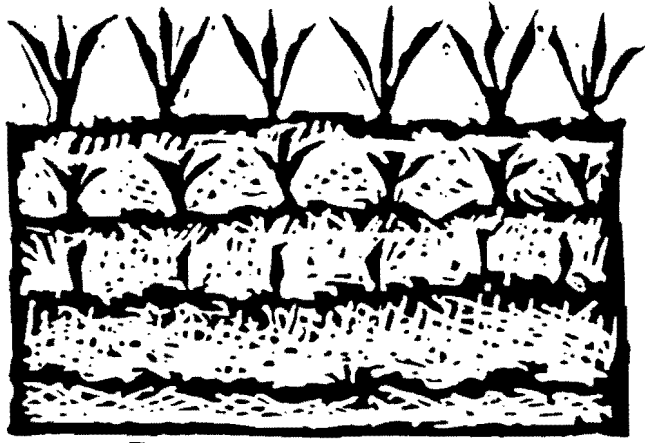
Located in downtown Detroit, the Belle Isle Nature Center provided an ideal place to build a wetland demonstration site. At the same time extensive revitalization work was taking place on Belle Isle, a group of local teens working with the National Wildlife Federation **EARTH TOMORROW**® program restored a small pond and wetland area. This proved to be no easy task, requiring the removal of overgrown phragmites, an invasive exotic plant, as well as outreach into the community to garner support including technical advice, supplies, and volunteer help.


The results have been outstanding. The new pond and enhancement of an existing emergent wetland reintroduced native plants to the area and provided habitat for wildlife in the city. The site will also be available for school field trips and other visitors to the Belle Isle Nature Center. Suzan Campbell, Naturalist at the Belle Isle Nature Center, was very enthusiastic about the project, "The site here at the Belle Isle Nature Center was particularly valuable in several respects: as an opportunity for "hands-on" learning about wetlands, as a positive example of community involvement in Detroit high school students, and finally, as a lasting teaching tool for our other visitors in years to come."

The Detroit teens were extensively involved in the hands-on component of developing this wetland area. Learning about native plants and animals helped the teens to increase their personal awareness of ecosystems and habitats. During several field trips teens used shovels, trowels, mulch, and watering cans and planted trees, shrubs, and other plants. Their efforts were also focused on developing a how-to booklet to help other teachers and their students in the Michigan area create urban habitats.

The project received extensive support from the community. ANR Pipeline Co. Inc. helped prepare a computerized drawing of the site. The Greening of Detroit donated the expertise of their urban forester and together with the Friends of Belle Isle, donated trees. The project also received financial support from Dannon and the National Fish and Wildlife Foundation.

After nine months of hard work, the pond was filled and the final wetland plants were put in. The site was dedicated and certified as one of six national pilot sites for Schoolyard Habitats™, a National Wildlife Federation program. The lasting effects will probably most be realized with the participating students. As Donald Hicks, a 16 year-old from Osborn High School said, “How many city kids get a chance like this? Animals, trees, plants—there’s so much I never knew.”





Appendices

GLOSSARY

- adaptation* - a physical or behavioral trait that helps a plant or animal survive in its particular habitat.
- biodiversity* - the diversity of life on Earth, reflected in the variety of habitats and species, and in the genetic variation within species.
- city planning* - the drawing up of an organized arrangement of streets, parks, businesses, residential areas, etc., of a city.
- city systems* - functions of a city which maintain the health of a city.
- commercial* - zones occupied with private businesses.
- community* - an interacting population of various kinds of individuals in a common location.
- density* - the number of units in a set area of space.
- ecosystem* - the interaction of living and nonliving things in a habitat.
- environment* - the physical factors (climate, soil, water, air, living things, etc.) which surrounds a living thing.
- flora* - plants.
- fauna* - animals.
- green spaces* - public areas set aside for wildlife and recreation.
- habitat* - a place that contains all the nutrients, water, shelter, space and resources that a plant or animal needs to survive.
- impact* - have an effect on living and non living things in an ecosystem.
- industrial* - zones characterized by businesses that manufacture goods.
- infrastructure* - the underlying structure and basic framework of a city or populated area.
- institutional* - zones containing public organizations such as schools, green spaces, utilities, hospitals, libraries, etc.
- light pollution* - man-made light which interferes with biological, chemical, or physical processes of plants, animals, or humans.
- noise pollution* - man-made noise which interferes with biological, chemical, or physical processes of plants, animals, or humans.
- population* - number of living things in a given area.
- residential* - zones where people to live.
- sustainable communities* - human habitats built at a rate that eliminates loss of biodiversity and natural resources while improving economic opportunity and quality of life for all living things.
- urban* - characteristic or constituting a city.
- watershed* - the land area from which runoff water flows toward a body of water when it rains.
- wetlands* - marshy areas into which water from surrounding land drains.
- zoning* - partitioning by ordinance into sections reserved for different purposes.

Guide to Activities

Looking for more activities for your class? The following chart lists activities from the *Animal Tracks Activity Guide* and the *NatureScope* series that apply to urban communities.

Activity Name/Source	Specific Grades	Science	Math	Language Arts	Social Studies	Art	Summary
Pollution Solutions NS Pollution p. 71	K-2	X			X		Make a flip-up page that shows solutions to common pollution solutions.
Pollution Patrol NS Pollution p. 4	K-8	X			X		Go on a scavenger hunt to search for signs of pollution.
Mammal Safari NS Mammals p. 40	K-8	X					Take a walk to look for signs of animals.
An Ant's View of Life AT p. 7	3-6	X		X		X	Look at the world from an ant's perspective.
Building Bird and Squirrel Feeders AT p. 8	3-6	X			X		Construct feeders for birds and squirrels and learn how to care for wild animals.
Clean Up Your Act! NS Pollution p. 72	3-8	X			X	X	Take action to reduce pollution.
Challenge Technology NS Pollution p. 75	3-8	X			X	X	Create ways to improve or replace current technologies, and then look at some real pollution-fighting inventions.
Pollution Pursuits NS Pollution p. 9	3-8	X			X		Answer pollution survey questions and play a pollution trivia game.
Tree Champs NS Trees p. 56	3-8	X	X				Measure trees and hold a contest to find the biggest tree in town.

Tricky Tracks NS Mammals p. 45	3-8	X					Identify mammal tracks, then solve some snowy track mysteries.
Be a Water Treatment Officer AT p. 55	4-6	X			X		Simulate the way water is cleaned in a water treatment plant.
What To Do With an Empty Lot? AT p. 10	4-12	X	X	X	X		Role play different interest groups to decide the fate of an empty lot.
Animal Invitation AT p. 16	4-12	X		X	X		Develop a habitat area for wildlife in the schoolyard.

Key

AT= *Animal Tracks Activity Guide for Educators Grades 4 to 6* (Item 79928)

NS Mammals=*NatureScope, Amazing Mammals Part I* (Item 75023)

NS Pollution=*NatureScope, Pollution: Problems & Solutions* (Item 75045)

NS Trees=*NatureScope, Trees are Terrific!* (Item 75021)

All available from the National Wildlife Federation, 8925 Leesburg Pike, Vienna, VA 22184. 1-800-477-5560.

Resources

Resources for Teachers

Background Information

The Backyard Naturalist by Craig Tufts. National Wildlife Federation, 8925 Leesburg Pike, Vienna, VA 22184. An informative collection of simple changes to make in your own backyard to attract wildlife and create a natural area.

Cities in Our Future by Robert Geddes. Published by Island Press, Box 7, 24850 East Lane, Covelo, CA 95428, (800) 828-1302. Examines the impact of a city's growth and form on the ability of its citizens to achieve and maintain social equity and environmental health. ISBN#1-55963-496-0, \$22.50.

Education for Sustainability by John Huckle and Stephen Sterling. Published by Island Press, Box 7, 24850 East Lane, Covelo, CA 95428, (800) 828-1302. Written for formal and informal education sectors, it provides perspectives on the philosophy, politics, and pedagogy of education for sustainability, as well as case studies and pointers towards good practice. ISBN# 1-85383-256-1, \$26.00.

Education for Sustainability: An Agenda for Action. Published by the U.S. Government Printing Office, Superintendents of Documents, Mail Stop: SSOP, Washington, DC 20402-9328, web site - <http://whitehouse.gov/WH/EOP/pscd/> ISBN# 0-16-048783-8. Framework and guidelines for implementing education for sustainability in both formal and non-formal settings.

Resource Guide for Creating Successful Communities by Michael A. Mantell, Stephen F. Harper, and Luther Propst, Conservation Foundation. Published by Island Press, Box 7, 24850 East Lane, Covelo, CA 95428, (800) 828-1302. A practical compendium of techniques for effective land use and growth management. ISBN# 1-55963-015-9, \$27.50.

Sustainable Communities: A New Design Synthesis for Cities, Suburbs and Towns by Sim Van der Ryn & Peter Calthorpe. Published by Sierra Club Books, San Francisco, CA. Provides a practical vision of how different types of American communities can make the transition to a way of life that encourages sustainability, reduces resource waste, balances consumption and production, and produces long-term social and ecological health. ISBN# 0-87156-629-X, \$20.00.

Urban Wildlife Habitats: A Landscape Perspective by Lowell W. Adams. Published by University of Minnesota Press, 1994. Discusses the roles ranging from small city parks in densely built downtowns to suburbs with large yards and open space as viable wildlife habitats. ISBN# 0-8166-2213-2.

Activity/Curriculum Guides

City Kids and City Critters: Activities for Urban Explorers by Janet Wier Roberts & Carole Huelbig, Houston Arboretum & Nature Center. Published by Learning Triangle Press, (800) 822-8158. An activity guide to discovery of natural things in an urban area. ISBN# 0-07-0533201-X, \$15.95.

Environmental Education in the Schools: Creating a Program that Works! By Judy A. Braus & David Wood. Published by Peace Corps Information Collection and Exchange and North American Association for Environmental Education, Suite 400, 1255 23rd Street, NW, Washington, DC, 20037. Activities with a multi-cultural emphasis.

Investigating and Evaluating Environmental Issues and Actions: Skill Development Modules by Harold R. Hungerford. Published by Stipes Publishing Co., PO Box 526 Champaign, IL 61824, (217) 356-8391, student edition \$9.80, teacher edition \$18.80.

The Kid's Guide to Social Action by B.A. Lewis. Published by Free Spirit Publishing, 400 First Ave. N., Suite 616, Minneapolis, MN 55401, (612) 338-2068, \$14.95.

Living Lightly in the City & Living Lightly on the Planet: An Urban Environmental Education Curriculum by Maura O'Connor & Kathy McGluffin. Published by Schlitz Audubon Center, 1111 East Brown Deer Road, Milwaukee, WI 53217. (414) 352-2880. A series of activity guides focusing on environmental topics in an urban setting.

Community Sustainability: A Mini-Curriculum for Grades 9-12 by Benedict J. Hren and Diane M. Hren. Available from The Izaak Walton League of America, 707 Conservation Lane, Gaithersburg, MD 20878, (301) 548-0150, \$2.00. Activities geared toward high school. Also, contains an extensive reference guide to organizations focusing on local, regional, and national community sustainability.

Taking Action: An Educator's Guide to Involving Students in Environmental Action Projects. Published by Project WILD, 5430 Grosvenor Lane, Bethesda, MD 20814 (301) 493-5447, \$3.00. A guide to help teachers and students through the process of developing and implementing action projects.

Ten-Minute Field Trips by Helen Ross Russell, 1991. Describes more than 200 close-to-home trips that explore new dimensions of familiar spaces and objects like brick walls, rock outcroppings, and lawns. Ages 5-13 Available through National Science Teachers Association (800) 722-6782, \$16.95.

Where We Live: A Citizen's Guide to Conducting A Community Environmental Inventory by Donald F. Harker and Elizabeth Ungar Natter, Mountain Association for Community Economic

Development. Published by Island Press, Box 7, 24850 East Lane, Covelo, CA 95428, (800) 828-1302. A practical workbook helping citizens find information concerning their local environment and use that information in furthering environmental goals. ISBN# 1-55963-377-8, \$18.95.

For Children

Animal Adoption Kits. Adopt a whale, wolf, or dolphin and learn about its habitat through quarterly updates. Kit includes a poster of the species and a "certificate of adoption." Available through the National Wildlife Federation, 8925 Leesburg Pike, Vienna, VA 22184. Wolf Kit (Item #37822), Whale Kit (Item #37816), and Dolphin Kit (37823), \$20 each. 1-800-477-5560.

One Small Square: Backyard by Donald M. Silver. Published by WH Freeman and Company, New York. Explores the natural wonders found in backyards everywhere. ISBN# 0-7167-6510-1

Secret Place by Eve Bunting. Published by Clarion Books. Tells the story of wildlife in a secret place in a city along an L.A. river in its concrete bed.

Urban Roosts: Where Birds Nest in the City by Barbara Bash. Published by Sierra Club Books. Describes the birds that make their homes in the heart of the city and examines how they have adjusted to an urban environment. ISBN# 0-316-08306-2.

Wanda's Roses by Pat Brisson. Published by Caroline House, 1994, ISBN# 1-56397-136-4. A delightful story of a community pulling together to make a girl's dream of a rose garden in a vacant lot come true.

Where Once There Was a Wood by Denise Fleming. Published by Henry Hold and Company, 1996, \$15.95. The story of everyone's need for a home. Deer live in the woods, rabbits live in meadows, fish live in creeks, and people live in houses, but we need not destroy one home while building another.

Wild in the City by Jan Thornhill. Published by Sierra Club Books. Illustrates the wildlife a girl sees in her neighborhood and how the wildlife interacts in an urban food chain.

Videos

All below videos available from:

Bullfrog Films, Box 149, Oley, PA 19547, (800) 543-FROG, <http://www.bullfrogfilms.com>

Decision: Energy for the Future. An amusing, animated history of energy use, demonstrating our recent dependency on fossil fuels which, if continued, could lead to disastrous consequences. \$49, grades 4-adult, 11 minutes.

Going Green: How to Reduce Your Garbage. Provides a step-by-step guide to reducing the “unfriendly” impact of households on the environment. \$49, grades 5-adult, 22 minutes with teacher’s guide.

Making a Difference: Restoring the Earth Around Us. An inspiring portrait of three grassroots restoration programs that will encourage viewers to get out of their houses and into their communities to reclaim the earth. \$49, grades 7-adult, 28 minutes with study guide.

One Second Before Sunrise: A Search for Solutions. A seven part series of programs which focus on solutions to environmental problems and provides viewers with ideas and inspiration for their own homes and communities. Grades 7-adult, 60 minutes each with study guides.

Organizations/Internet

American Planning Association, 122 South Michigan Avenue, Suite 1600, Chicago, IL 60603. Internet site, <http://www.planning.org>, includes conference information, educational opportunities, and current issues in planning.

Izaak Walton League of America, 707 Conservation Lane, Gaithersburg, MD 20878, (301) 548-0150.

President’s Council on Sustainable Development, 730 Jackson Place, NW, Washington, DC 20503, (202)408-5296, e-mail: pcsd@igc.apc.org or web site: <http://www.whitehouse.gov/PCSD>
The mission of PCSD is to develop a national sustainable development action strategy that will foster economic vitality while protecting our natural and cultural resources.

United Nations Educational, Scientific and Cultural Organization (UNESCO), 77, Place de Fontenoy, 75352 PARIS 07 SP, Paris, France, web site: <http://www.unesco.org>
UNESCO promotes collaboration among nations through education, science, culture, and communication in order to advance universal respect for justice, law, and the human rights and fundamental freedoms that are affirmed for the people of the world.

Urban Land Institute, 625 Indiana Avenue NW, Suite 400, Washington, DC 20004-2930.
Internet site: <http://www.uli.org>

U.S. Fish and Wildlife Service. Internet site, <http://www.fws.gov>, includes a list of officially listed endangered species.

World Resources Institute, 1709 New York Avenue NW, Washington, DC 20006. Internet site, <http://www.wri.org>, includes teacher’s guides for use at the secondary school level that weave together lessons about both environment and development, both globally and locally.

Get Recognized!

Once you've gotten your hands into your city, its time to recognize your achievement.

- Keep in touch! Let NWF and Animal Tracks know about the great work you've been doing. Send us cards, letters, photos or an e-mail to bradley@nwf.org. We'll put your success stories up on our World Wide Web site: <http://www.nwf.org/>
- Throw a party. You've worked hard and should celebrate. Have pizza or "pot luck" and invite parents, others in your school, and/or community leaders to show or tell them about the terrific habitat project you've working on.
- Get media coverage. Contact local TV stations and newspapers and tell them about your project. They may be interested in covering you and your habitat.
- Apply for recognition. The following award programs offer recognition for environmental projects...

Keep America Beautiful

To youth and school groups for environmental improvement. Annual.

Address:

Keep America Beautiful
Awards Program Coordinator
9 West Broad Street
Stamford, CT 06902
(203) 323-8987

President's Youth Service Awards

To youths ages 5-22 for community service

Address:

President's Youth Service Awards
P.O. Box 310
New Castle, DE 19720
(302) 323-9659

Albert Schweitzer Environmental Youth Award

To youths and youth groups ages 12-18 for environmental change in the community.

Address:

Albert Schweitzer Institute for the Humanities
P.O. Box 550
Wallingford, CT 06492-0550
(203) 697-2741

Schoolyard Habitats

Certification and information program for school habitats.

Prepaid certification kit application fee \$14.95 (Item# J4-79948)

Address:

Schoolyard Habitats

National Wildlife Federation

8925 Leesburg Pike

Vienna, VA 22184-0001

1-800-822-9919

<http://www.nwf.org/nwf/prog/habitats>



NATIONAL WILDLIFE FEDERATION®

The National Wildlife Federation has many educator and training resources available. Here's how to find out more about them...

NATUREQUEST®

NatureQuest is NWF's certified training program for teachers, camp program directors, nature and science counselors, naturalists, and outdoor educators. At this three-day action-packed workshop, participants discover new nature study activities, refine teaching techniques, and



NatureQuest
NATIONAL WILDLIFE FEDERATION

exchange valuable ideas and information with peers from other camps and youth programs. Training is offered at sites across the country, primarily during the spring. Groups of 25 or more can request a NatureQuest training session reserved and planned specifically for them. For more information, call 1-800-822-9919.

NATIONAL WILDLIFE WEEK

During National Wildlife Week, NWF distributes over 620,000 kits to teachers across the country. For the 1997 Wildlife Week April 20 to 26, the theme is "Nature's Web: Communities and Conservation." Wildlife Week Kits are distributed through individual NWF Affiliates. Consult the NWF Conservation Directory or your local library or phonebook to find the address of the NWF Affiliate in your state.



Conservation Summits™

CONSERVATION SUMMITS®

Conservation Summits provide unique learning opportunities for teachers, outdoor educators, youth leaders, and parents at some of America's most spectacular sites. During these week-long, family-oriented adventures, participants can take advantage of special classes that provide instruction on introducing children and students to the study of nature and the environment. Classes include integrating environmental education into an existing curriculum, teaching techniques for nature study, and an introduction to available environmental education materials. University credit is offered at all locations. For more information, call 1-800-822-9919.





**BACKYARD WILDLIFE
HABITAT**
NATIONAL WILDLIFE FEDERATION

**BACKYARD WILDLIFE
HABITAT PROGRAM**

The Backyard Wildlife Habitat program encourages people in all parts of the U.S. and Canada to supply the basic elements that wildlife need to survive: food, water, shelter, and a place to raise young. Anyone with a yard, no matter what size, can easily create a home for wildlife. Once the basic elements are provided, one may apply for certification and join the list of over 18,500 official Backyard Wildlife Habitats. To order an information kit about this program that contains a planting guide, a copy of *The Backyard Naturalist* by NWF's chief naturalist, and an application, call 1-800-477-5560 and ask for item #79946.



**SCHOOLYARD HABITATS
PROGRAM**

Schoolyard Habitats encourages and assists school communities in establishing habitat-based learning sites. The program emphasizes wildlife habitat conservation on school and learning center grounds, cross-curriculum learning and teaching, and community involvement. For more information call 1-800-822-9919.

**CONSERVATION
DIRECTORY**

The *Conservation Directory* is an annual publication of the National Wildlife Federation and continues to be the most complete source for up-to-date detailed information on environmental conservation organizations. The 1997 edition lists over 2000 governmental and non-governmental organizations and personnel involved in conservation work statewide, nationwide, and worldwide. The directory may be purchased by calling 1-800-477-5560. The 1997 edition is \$55.00 plus shipping and handling. For more information on how to get your organization listed, call 703-790-4402.



CAMPUS ECOLOGY

Campus Ecology establishes environmentally sound practices on college campuses by promoting leadership and action within the campus community. By communicating to campus organizers what other students, faculty and administrators, and the broader environmental community have learned, Campus Ecology recognizes the efforts of people who work on outstanding projects by documenting and publishing their accomplishments. For more information, call 703-790-4318.



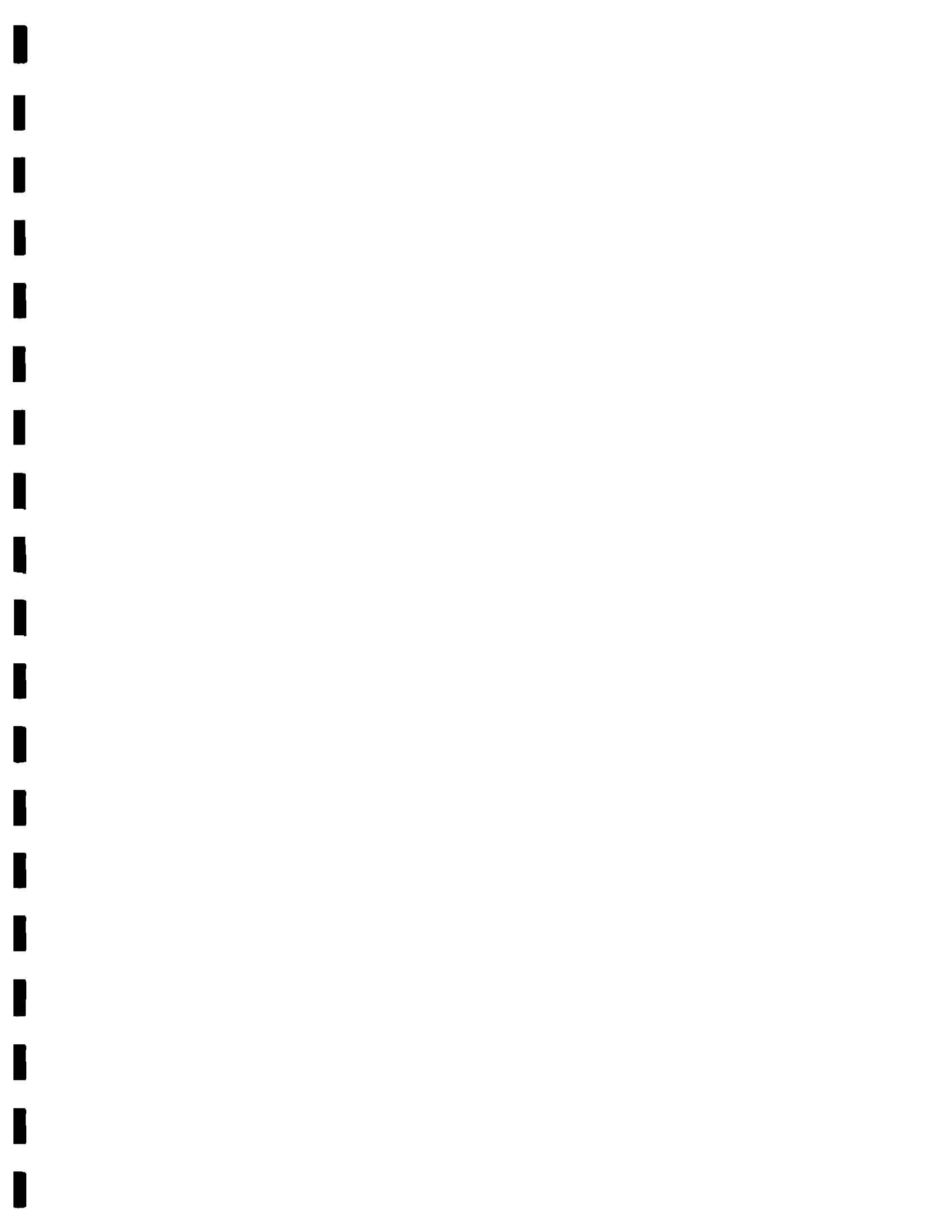
EARTH TOMORROW®

EARTH TOMORROW® is an urban environmental education leadership program whose goal is to provide high school students, beginning with tenth graders, with an opportunity to learn about the natural resources and wildlife in their city through a series of activities that include classroom training, a week-long workshop, and action-oriented environmental projects. Through these experiences, students acquire a sense of environmental stewardship; develop their own skills, talents, and resources; gain the tools needed to make a difference in their communities; and begin to see how they can be involved to positively affect environmental conditions. With these experiences as a base and guidance from NWF staff and the many **EARTH TOMORROW®** partners (teachers, schools, universities, state departments of education, community organizations, government organizations, businesses), students will understand possible career paths in conservation and environmental fields. **EARTH TOMORROW®** is currently being piloted in Detroit, MI by NWF's Great Lakes Natural Resource Center (GLNRC) in cooperation with the Michigan United Conservation Club (MUCC). For more information, call Carey Rogers at NWF's GLNRC, 313-761-3989.

WILDLIFE CAMP™

Wildlife Camp™ offers summer discovery and outdoor adventure for 9-17 year olds. Two-week sessions provide an opportunity to explore the natural world and learn about wildlife in a fun, outdoor setting. Focus on wildlife and nature study combined with traditional camp activities like hiking, fishing, crafts, camping, and outdoor living skills. 1-800-245-5484





About Animal Tracks Action Packs

MN01962
BRA



Animal Tracks Action Packs are a classroom resource, educating students about environmental issues through discovery, awareness, and action. Look for Action Packs on Recycling, Water, and Habitat, with more topics to come!



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