

# Inspiring Children's Spirit of Stewardship:



## A TOOLKIT for Families

### Dear Families,

Wherever we live in our world, we know it's vital that our children grow up to become the next generation of environmental stewards. The best way to protect our environment in the future is to help our children grow up with a love for the earth today. The best way to prepare our children for the world they're going to inherit is to empower them to become problem-solvers and critical thinkers.

It's important to engage our children in conservation activities that focus on positive actions without worrying them about frightening aspects of environmental problems they're too young to understand. The activities in this Toolkit (designed for ages 3-8) will suggest fun ways for your family to focus on positive actions you can take together to help the world we share become a "greener" and healthier place.

Each activity will focus on one stewardship-related theme and follow this format:

### 1. Have an Adventure

**Help Children Get Personally Engaged.** The field-tested science-based outdoor activities suggested for each stewardship theme enhance children's observation and problem-solving skills and prepare them to want to take action to "green" the environment. Activities are open-ended so they can be adapted to children's individual interests and needs. Print one activity sheet per person. Each activity comes with "Tips for Families."

Have an Adventure!

### 2. Take Action

For each stewardship theme families take one action that will help "green" the environment.

Take Action!

### 3. Celebrate Your Action

Talk with your children about how their positive action is helping our world become a "greener" and healthier place.

Celebrate Your Action!

### 4. Keep Growing

Use the list of resources provided to find other fun ways to support this stewardship activity at home.

Keep Growing!

*Please note: A valuable home-school connection can be fostered if families use the Family Action Toolkit while schools are also implementing activities with the same theme. Let your child's teacher know about the Toolkit for Early Childhood Programs available on this Web site.*

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Arbor Day Foundation and  
Dimensions Educational Research Foundation



# Inspiring Children's Spirit of Stewardship: A TOOLKIT for Families

## Stewardship Themes



### Plants

Trees



### Air

Wind



### Water

Rain



### Soil

Composting



### Energy

Light



### Animals & Insects

Bugs



### Human Health

Sense of Wonder

**A Note to Families:** The stewardship themes you see above were chosen based on recommendations from many environmental and educational groups throughout the world. Each theme provides children opportunities for hands-on enjoyment and caretaking. Please use the suggested activities as a beginning, and feel free to add your own adaptations and ideas. Help your children know that these topics are important to all children wherever they live in our world.

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## Tips for Families

### Using “You and a Tree” Activities

- Take a walk in your neighborhood. Find a tree that you find interesting.
- Encouraging children to relate parts of trees to their own body parts will help them observe closely and develop a sense of wonder about trees.
- Helping children learn to appreciate all living things starts them on their journey toward becoming life-long environmental stewards.
- Purposeful movement activities (such as asking children to move like a tree) will help children put information into their muscle memory and are especially good for children who need to move to learn).

Moving is good for all of us, so play along with your child and have some fun!

- During the part of the activity where children are pretending it is raining, you may want to try misting them with a bit of water from a spray bottle.
- Encouraging children to draw parts of the tree will help them notice and appreciate details.
- Children can draw in many ways--with crayons or pencils on paper; with chalk on a sidewalk; or by drawing in the dirt with a stick or a finger.



**NOW use the “You and a Tree” activities with children.**



# You and a Tree

(part one)

**First**, explore your yard, take a walk, or visit a park. Try these activities with favorite trees you find. Let's explore the tree's parts.

**Roots** are like the tree's feet. They keep the tree sturdy and hold it to the ground (just like your feet keep you sturdy). Roots also help the tree soak up water.

Can you put your own **feet** near the tree's roots? .....



**Branches** are like the tree's arms.



Can you put your own **arms** near the tree's branches? .....

**Bark** is like the tree's skin. It keeps the tree protected and covered all over (just like your skin protects you).

Feel your **skin**.



Now feel the tree's bark.



**What is the difference?** (Describe how each one feels.)





# You and a Tree

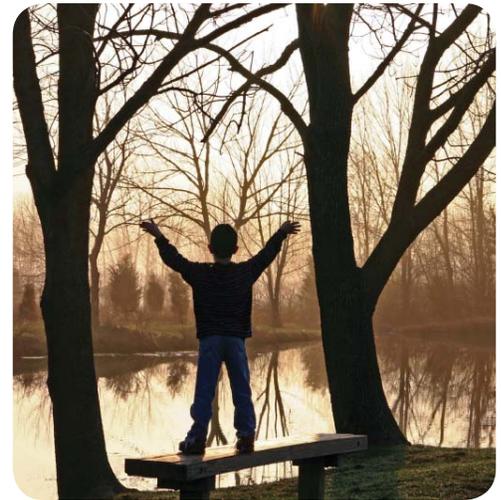
(part two)

Can you make your **body** into the shape of a **tree**?

Pretend your **feet** are the tree's **roots**,

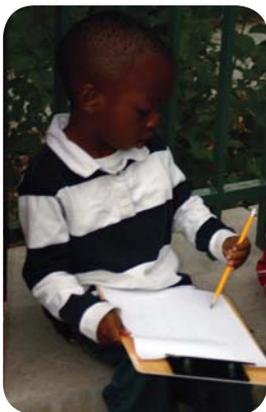
your **stomach** is the tree's **trunk**,

and your **arms** are the tree's **branches**.



Can you move your **body** like a tree in the **wind**?

Can you shake your **arms** like tree branches in the **rain**?



Can you **draw** a picture of your tree and all its **parts**?

Will you draw with pencil, chalk, or your finger in the dirt?





# Care for a Special Tree

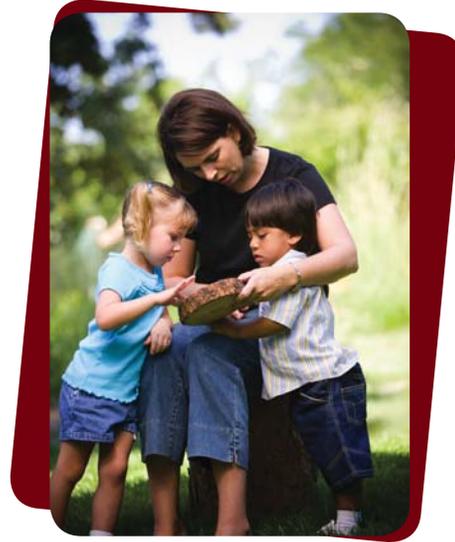
## Talk About It

Talk with children about choosing a special tree on or near your home that they would like to care for and observe throughout the year.

## Caretaking Ideas

Help children begin to view themselves as their tree's caretakers:

- Encourage children to frequently check the soil near the trunk and water as needed when the soil feels very dry.
- Let children know that all trees need "a blanket of mulch" around their trunks to keep them healthy and well. Encourage children to add mulch whenever needed. \* See "The Value of Mulch" below.
- Solicit ideas from children about what they think their tree needs. (Reading books together might spark more ideas.)



## Observation Ideas

Help children become great observers of their tree throughout the year. Encourage children to:

- Sketch the tree monthly to watch for growth and changes. (Children may want to take photographs of it as another way to document changes throughout the year.)
- Watch the tree closely to note if it has provided food or habitat for any animals or insects.
- Write a story about the tree and its life. (Ask children: Do you know how old your special tree is? How can you find out?)
- Think about other interesting ways to record observations.

## The Value of Mulch: A Tree's Best Friend



Mulch is a tree's best friend. It insulates soil, retains moisture, keeps out weeds, prevents soil compaction, reduces lawn mower damage, and adds an aesthetic touch to a yard or street. Remove any grass within the mulch area, an area from 3 to 10 feet in diameter, depending on tree size. Pour wood chips or bark pieces 2 to 4 inches within the circle, but not touching the trunk. (Source: Arbor Day Foundation Web site: [www.arborday.org/trees/NineNum4.cfm](http://www.arborday.org/trees/NineNum4.cfm))

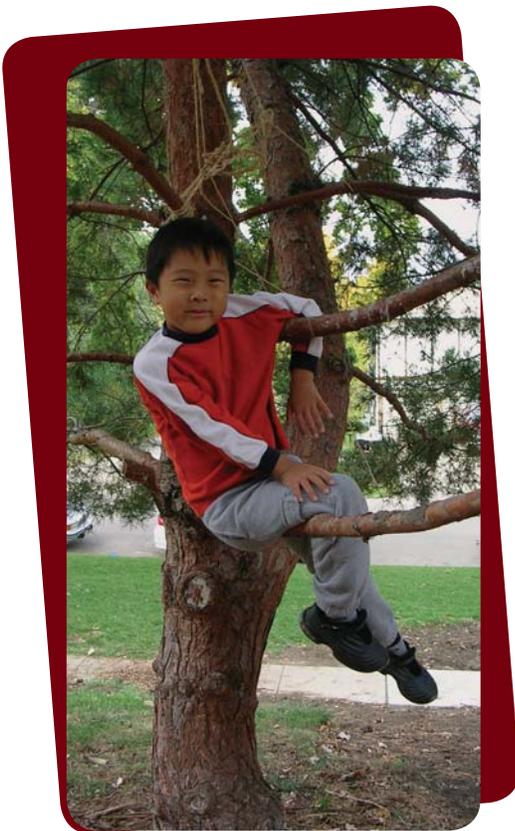




## Caring for Trees is Good for our Earth!

### Message to Families

Getting children involved in hands-on activities is essential for developing a true understanding of environmental issues. Caring for trees is one way they can truly connect with the world around them and begin thinking of themselves as environmental stewards in a developmentally appropriate way. (Read Dr. Louise Chawla's paper, The Benefits of Nature for Children at [www.foresthistory.org/education/Curriculum/BenefitsofNature-Chawla.pdf](http://www.foresthistory.org/education/Curriculum/BenefitsofNature-Chawla.pdf))



Help children feel good about how their caretaking actions are helping our earth by sharing some of these positive messages about the value of trees:

**Trees help shade and cool our homes or apartments and help us save energy.**

How? The cooling effect of a young, healthy tree is the same as ten room-sized air conditioners operating 20 hours a day!

**Trees and natural landscapes help us feel healthier.**

How? Studies show that hospital patients with a view of trees out their window have shorter recovery time than other patients. Children who feel connected to nature have better physical, mental, and emotional health.





# More Resources About Trees

### Web Sites:

[www.arborday.org](http://www.arborday.org)  
(Arbor Day Foundation)

[www.natureexplore.org](http://www.natureexplore.org)  
(Nature Explore Families' Club)  
Adventure Activity 1: Get to Know a Tree  
Adventure Activity 3: Your Very Own Story

[www.plt.org](http://www.plt.org)  
(Project Learning Tree)

[www.treesftf.org](http://www.treesftf.org)  
(Trees for the Future)

[www.unep.org/billiontreecampaign](http://www.unep.org/billiontreecampaign)  
(UNEP Billion Tree Campaign)



## FUN FACTS ABOUT TREES!

Help children think about the many gifts trees provide for people, such as food, medicine, clothing, or furniture. Here are some great examples...

### Coconut Trees

Coconut trees are palms that grow up to 30 metres high. Known as the 'tree of life' because of their huge variety of uses, they grow throughout the tropics. In many parts of the world people use their leaves to make clothing, mats, baskets and roofs. Their fruits provide food, drink, oil, and medicine, and their wood helps build houses and boats.

(Source: [www.plantcultures.org](http://www.plantcultures.org))



Coconut Tree

### Banana Trees

Did you know that in many parts of the world, the leaf from a banana plant is used like a plate? In West Africa, for example, banana plant leaves are used to hold the batter for steamed bean or grain cakes.



Banana Leaf

## Tips for Families

### Using “Air in Motion” Activities

- Building connections with the natural world by helping children become aware of the air around them is the focus of this activity.
- There are many benefits of purposeful movement experiences such as creating body poses and movements. Many ways children benefit include:
  1. increased confidence in what their bodies can do (body competence);
  2. increased ability to calm themselves through non-locomotor (stationary) movement.
  3. heightened awareness and greater focus.
- Try this activity on several occasions and at different times of the day. Then compare how the wind feels and try to detect some patterns such as calmer breezes in the evening.
- The wind’s eternal power has been the inspiration for many folk tales around the world. Try to find a wind story that originated in your part of the world and read it or tell it to your children.



**NOW use “Air in Motion” activities with children.**



# Air in Motion

(part one)



Go outside and see if you can feel or see evidence of **wind**...which is **air in motion**!



Try holding a blade of grass, a leaf, or a scarf.

What happens when you let go?  
Is the wind blowing today?  
Did you feel the **wind's power**?



Wind helps plants grow by **blowing** seeds to new places. You can blow like the wind too!

Can you pretend that your body is blowing in the wind? How does your movement change if the air is moving fast or slow?





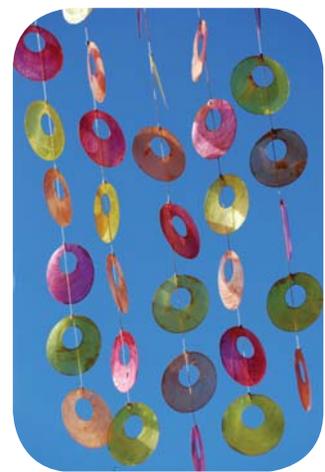
# Air in Motion

(part two)

Let's build a **mobile** outdoors to help us see the wind's power. >

First, can you collect some **natural items** that you can hang?

They can't be too heavy.



Now attach them with string to build a mobile.

Where will you hang them?  
On a tree branch?  
Somewhere else near your home?



Now watch your mobile.  
Do you see the **wind's power** > to make your objects move?



# Use Wind Power to Dry Clothes

## Talk About It

This activity is meant to connect children more fully with the benefits of the wind and air around them. Making physical connections (in this case, hanging clothing in the wind) will help children put their new knowledge into their muscle memory.

*“Children more than ever, need opportunities to be in their bodies in the world -- jumping rope, bicycling, stream hopping and fort building. It’s this engagement between limbs of the body and bones of the earth where true balance and centeredness emerge.”*

-David Sobel, Childhood and Nature

## Hang a Clothes Line

Talk as a family about how wind has been used by humans for thousands of years for things like carrying ships, pumping water and grinding grain. One way that everyone in our world can use wind is to help dry our clothes!

Try installing a line outdoors so your family can dry clothes on it. (You could make your clothes line in an easy way by hanging a rope between two trees or buildings. Be sure to install it at child height.)



When you hang your laundry together, talk about the fact that the wind is giving you energy to dry your clothes. That means you don't need to use electricity or spend money running an electric clothes dryer.

# Using Wind Power is Good for Our Earth

## Message to Families

One of the cheapest and greenest means of drying clothes uses no appliance at all. The simple clothes line and clothes pins technology costs hardly anything. Using the heat of the sun and drying power of breezes, clothes lines are making a comeback in many places around the world.

In most homes, a clothes dryer is typically the second-biggest electricity-using appliance after the refrigerator. In the United States, an electric dryer is expected to cost \$1,530 US over the course of its expected lifetime of 18 years.



Share these positive messages with children:

**You are helping our earth when you hang clothes outside so they can dry in the wind.**

**Using wind power means we don't need to use electric dryers, and that is good for our world!**

## More Resources About Wind

### Web Sites:

[www.re-energy.ca](http://www.re-energy.ca)

This Canadian website has scientific information on how wind energy is generated, captured, and its potential uses.

[www.eia.doe.gov/kids/energy.cfm?page=wind\\_home-basics](http://www.eia.doe.gov/kids/energy.cfm?page=wind_home-basics)

This United States Department of Energy website for kids offers information on wind and other renewable energy sources.

[www.arborday.org/globalwarming/windbreak.cfm](http://www.arborday.org/globalwarming/windbreak.cfm)

The Arbor Day Foundation website has information on the wind-related conservation benefits of planting trees for homeowners and farmers. Conifer trees can serve as a windbreak to protect homes from winds and conserve energy.



### FUN FACTS ABOUT WIND

- Spiders are notorious wind travelers. They are able to use their silk as a simple parachute to carry them from one place to another. Here's how it works: From the top of a platform (like a blade of grass), the spider faces the wind. Standing in a "tip-toe" position, with its abdomen pointing toward the sky, it releases a stream of silk from its spinneret. Lift off! The wind carries the spider through the air.
- Hundreds of species of seeds travel and are spread by wind. Most commonly they are in the shape of a parachute, glider or helicopter. They have even been the inspiration for the design of early aircraft!
- A remarkable winged seed is found on the tropical Asian climbing gourd *Alsomitra macrocarpa*. The entire seed has a wingspan of 5 inches (13 cm) and is capable of gliding through the air of the rain forest in wide circles. This seed reportedly inspired the design of early aircraft and gliders.
- Wind impacts the shape of trees as they grow. Some are even called flag trees because the branches only grow on one side of the tree.



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## Tips for Families

### Using “A Rainy Day Adventure” Activities

- As adults we often forget the wonder of simple moments in nature. Standing and playing in the rain is universally joyful.
- Helping children experience joy rather than fear from rain is important for their healthy development.
- If you live in a climate with infrequent rain you may want to have this activity “at the ready” for when the rain begins to fall.
- The rain water you gather in this activity should be used only for non-drinking purposes.
- Encouraging children to use many words to describe how the rain feels will help boost their vocabulary.
- Think together as a family about many ways to use the water you gather. Helping children think of their own ways to solve problems is one of the greatest things we can teach them.



**NOW use “A Rainy Day Adventure” activities with children.**



# A Rainy Day Adventure

(part one)

Wouldn't it be fun to **play outside in the rain?**  
Let's try it!



How does the rain feel on your skin?



Do you notice rain helping any living things?

Where does the rain go when it falls to the earth?



Let's put out a container and leave it in the rain for awhile. ....>

**What do you think will happen?**





# A Rainy Day Adventure

(part two)

Let's go out and check the container in the rain. **What happened?** .....



Now that you have collected some precious rain water, decide what to do with it.



Draw or tell about your ideas for helpful ways to use the water.



What do you think we should do with it?



Should we give it to a **plant?** .....

Put it in a **bird bath?**



What other ideas do you have?



Share your ideas together as a family, then vote to decide which idea you all want to choose.

**Thank you for finding helpful ways to use the rain water!**



## Catch Some Rain Water

### Talk About It

Every time it rains, water runs off surfaces, such as roofs, and flows across land, collecting dirt, fertilizer, oil or garbage along the way. The United States Environmental Protection Agency estimates that pollutants carried by rainwater runoff account for 70% of all water pollution.

A rain catcher can collect rainwater runoff and prevent excess water from leaving the property, allowing you to save the water for later use.



### Create a Rain Catcher

Now that you have collected and studied water, you can create a more permanent way to conserve it by building a rain catcher. This can be any container used to collect rooftop runoff for non-drinking uses. Some people put up a rain chain that directs water from a rooftop or gutter to a container or basin.



Some people attach their gutters to a barrel to collect rainfall. Go to this website for photos and instructions for creating a rain barrel.

[www.ehow.com/how\\_2070724\\_best-rain-barrel.html](http://www.ehow.com/how_2070724_best-rain-barrel.html)





# Being Careful with Water is Good for our Earth

## Message to Families

Nature has a way of taking care of itself. When nature is left undisturbed, things work together to keep the system stable. You can find this kind of balance and regulation in all natural systems, including our own body. Sharing this idea with children will help them grow up to be more thoughtful consumers of our world's precious water resources.



Here are messages you can give children to help them celebrate the actions you are taking to conserve water and help children appreciate all that water provides us:

**Many people in the world do not have enough clean water to drink or to use for washing themselves and their food.**

**Thank you for finding ways to use less water every day, and clever ways to re-use water.**



**It is so helpful to our whole world when we are careful with our water!**



## More Resources About Rain

### Web Sites:

[www.naturalinquirer.org](http://www.naturalinquirer.org) and [www.scienceinvestigator.org](http://www.scienceinvestigator.org)  
These USDA Forest Service websites are online journals for scientist to share their findings with students and are geared toward different age groups. All of the research in these journals is concerned with nature, trees, wildlife, insects, outdoor activities and water.

[www.globalwaterchallenge.org](http://www.globalwaterchallenge.org)

This Global Water Challenge Initiative website provides information about their work towards innovative solutions for water delivery and sanitation worldwide.

[www.pottersforpeace.org](http://www.pottersforpeace.org)

Potters For Peace is a nonprofit member of the World Health Organization International Network to Promote Household Waste Treatment and Safe Storage. PFP assists in the production of low-tech, low-cost, water filtration systems.



### FUN FACTS ABOUT RAINWATER

- The Moringa tree, which grows in Africa, India, South East Asia and Central and South America has seeds that can be used to filter water. The process involves grinding the seeds into a paste, mixing it with untreated water, waiting for the impurities to settle to the bottom, and siphoning the pure water off the top. This removes about 90% of the bacteria!
- The elephant can smell water up to 3 miles away.
- A dog's nose is so sensitive that it can smell the difference between a plain tub of water and a tub of water with a teaspoon of salt in it.





## Tips for Families

### Using “Let’s Dig In” Activities

1. Decide how you can provide a place for children to explore soil. Be sure you know the soil is safe and is not contaminated by poisons or other hazardous materials.

- Is there a place outdoors that has safe soil where they can dig in the ground? Or, do you have raised planter beds filled with soil that will work?
- If neither of these options is available, set up some tubs filled with soil before you begin this activity.



2. Be sure to help children dress appropriately so you won’t worry about clothes getting dirty.
3. If possible, provide tools to help children explore soil, such as:
  - Small hand tools
  - Colanders for sifting soil
  - Magnifying glasses for close observation

**NOW use “Let’s Dig In” activities with children.**



# Let's Dig In

(part one)

**First**, let's explore some **soil**.

What do you notice?  
Use all your **senses**.



**Look closely** – what do you find in the soil.....insects.....pieces of sticks.....?



What happens when you **sift the soil**?

What happens if you **add water to soil**?



Did you make mud?  
**How does it feel??**



# Let's Dig In

(part two)

**Now** let's make mud art!  
Which way will you **choose**?

Here are three ways to record:

1. Will you **make mud pies?** .....➔

2. Will you **draw on paper**  
with a **muddy finger**?



3. Will you make **large mud art**  
on the ground? .....➔

**Talk** as a family about all the things  
you've discovered about soil and mud.





## Create a Compost Bin

### Talk About It

Talk with children about why it is okay, even good, to get dirty sometimes. Help children think about soil as more than “just dirt.” Soil supports life literally “from the ground up.”

Ask children if they’d like to help you create a compost bin that can be used to enrich and protect soil. Compost adds nutrients to soil that helps keep plants healthy.



### How to Set Up a Worm/Compost Bin

What you need to get started:

- Storage bin (could be a plastic storage bin with a lid, if desired, or a metal bin that you will be able to poke holes in)
- Tray for under the bin
- Water
- Soil
- Red Wiggler Worms (*Eisenia Fetida*)
- Newspaper or paper to be recycled or dry leaves

What you do:

- Make bedding by tearing paper into strips and filling the container half full of paper and/or dry leaves.
- Add water to the bedding until it is damp.
- Add soil until the container is almost full, and add worms.

Feed Your Worms

- Add fruits and vegetable scraps, egg shells, tea bags and coffee grounds.
- Do not add meat bones or dairy products
- Periodically add water and more bedding as needed to keep it moist and mostly full.

You’ll know your compost/worm bin is healthy when your bin does not smell and your worms are having babies.



Stewardship Theme: Soil/Composting

# Compost Bins are Good for our Soil!

## Message to Families

Caring for Earth's resources needs to include nurturing our soil, also. Soil, like water, is the source of life and vital for plant growth. Now that children have closely observed soil and understand more about the benefits of healthy soil, here are some positive messages to celebrate with them:

**When you created a compost bin, you did something good to help our soil! Now we can put compost back in our soil to keep it healthier.**

**Healthy soil helps plants be healthier and helps us be healthier when we eat those plants!**





# More Resources About Soil

### Web Sites:

[www.soil.hostweb.org.uk](http://www.soil.hostweb.org.uk)

The World of Soil has information on soil types and care.

[www.ngm.nationalgeographic.com/geopedia/Soil](http://www.ngm.nationalgeographic.com/geopedia/Soil)

National Geographic's web site section, Geopedia Soil: A Dirty Word, provides succinct information and further references on the value of healthy soil.

The following three web sites all have more in-depth information on how to make worm bins or compost/worm bins:

[www.natureexplore.org](http://www.natureexplore.org)

Nature Explore (a collaborative project of Arbor Day Foundation and Dimensions Educational Research Foundation)

[www.nwf.org](http://www.nwf.org)

(U.S.) National Wildlife Federation

[www.cityfarmer.org](http://www.cityfarmer.org)

Canada Office of Urban Agriculture



## FUN FACTS ABOUT SOIL!

Did you know that plant roots and worm tunnels keep soil healthier and benefit the animals living in the soil?

The roots and tunnels loosen the soil, and this helps oxygen and water penetrate it more easily.

Did you know that the largest earthworm ever found was in South Africa and measured 22 feet from its nose to the tip of its tail?  
(Source: [urbanet.uluc.edu](http://urbanet.uluc.edu).)





## Tips for Families

### Using “The Sun’s Wonderful Light” Activities

- Looking directly into the sun can cause eye damage. Be sure to caution children against it.
- Gather mirrors, recyclable items that reflect light such as metal or aluminum, and even commercial prisms if you have them available to you. These items will help make “catching” the light and making your own prisms fun projects!
- Children can turn these adventures into games similar to hide-and-seek with their light.
- “Blocking” the light really is shadow play. Sunlight goes through many objects, so help children explore materials that totally block the sun’s light, and objects that the sun’s light can travel through. (It can be interesting to watch how sun shining through water looks.)
- Part two of this activity requires some preparation ahead of time. If you plan to use two plants, be sure they are very similar. If you are doing the project on grass, try making an interesting shape either with a garden hose or cut-apart garbage bags. You could make letters, an animal, or anything interesting to your children.
- Help children experience the scientific process of this whole activity by predicting, experimenting, and then analyzing their results.



**NOW use “The Sun’s Wonderful Light” activities with children.**



# The Sun's Wonderful Light

(part one)

Let's go outside and enjoy the **sunshine**.

Can you try catching the sun's wonderful and **powerful light**? .....

Look at ways other children have tried:



Can you try making a **rainbow**? .....

Can you block the light and **cast a shadow**?



# The Sun's Wonderful Light

(part two)

Find a sunny place where plant life is growing and find a way to block the sunlight for a few days.

Try blocking the sunlight by covering it up with a garden hose or towel (for example).



**What do you think will happen?**

After a few days uncover the plants. What do you notice?



**Almost all living things need sunlight to grow.**

Sunlight has wonderful power that is a big part of the cycle of life.





# Enjoy the Sun's Light

## Talk About It

Here are a number of concepts you can talk about with children:

- Sunlight provides energy for all living things.
- Plants use the sunlight to help them make sugars from the air they breathe through their leaves, and from water. This sugar is then used by the plant to grow.
- This process is called photosynthesis and is the most important process on the planet.
- People eat all sorts of things plants grow, such as leaves, seeds, fruit, roots, nuts and flowers.



## Have an Outdoor Picnic

Enjoy an outdoor picnic eating freshly harvested fruits and vegetables. Feed your body, mind and soul at the same time...we were all born to participate in the cycle of life! As you eat together, you can talk with children about the wonderful process of photosynthesis. (Don't worry if they don't grasp the entire concept. It's enough to simply celebrate how the sun's light helps plants make food for us!)





# The Sun's Light Makes us all Happier!

## Message to Families

The light from the sun's rays has produced energy for billions of years. Help children appreciate solar energy as a renewable source that can be converted into other forms of energy, such as heat and electricity. While these concepts may be too complicated for young children to grasp completely, simply fostering an appreciation for what we all gain from the sun's light will be a good first step in the right direction.

Here are positive messages to share with children:

**It's good to celebrate the wonderful light from the sun!**



**When you eat plants that grow in the sun's light, you will be healthier and happier!**





## More Resources About Sunlight

### Web Sites:

[www.discovertheforest.org](http://www.discovertheforest.org)

This United States Forest Service website has information on the benefits of time in nature and specific activity ideas.

[www.youtube.com/watch?v=p86BPM1GV8M](http://www.youtube.com/watch?v=p86BPM1GV8M)

Watch and listen to Dr. Carl Sagan's The Pale Blue Dot on this YouTube clip. The Pale Blue Dot is a photograph of planet Earth taken in 1990 by Voyager 1 from a record distance, showing it against the vastness of space. By request of Carl Sagan, NASA commanded the Voyager 1 spacecraft, having completed its primary mission and now leaving the Solar System, to turn its camera around and to take a photograph of Earth across a great expanse of space. In 2001, this photograph was selected by Space.com as among the top ten space science photographs.



### FUN FACTS ABOUT SUNLIGHT

- The sun has produced energy for billions of years. The sun's rays that reach the earth is solar energy. It can be changed into heat and electricity.
- Conifer needles need just the right amount of sunlight for the tree to produce food. The triangle shape of the tree is an adaptation that allows more needles to "see" the sun.
- Sunlight has an ancient legacy of healing. Prehistoric tribes and entire civilizations revered and worshipped the sun for its healing properties. Using light to treat medical conditions (both physical and mental) came to be known as heliotherapy. The Greek city of Heliopolis, was well-known for its temples of healing sunlight. In fact, both Hippocrates and Pythagoras wrote about the many benefits of sunlight to promote healing.
- Millions of years ago, the sun's energy helped prehistoric plants to grow. When we burn coal we are reusing that ancient sun energy, because coal is made from prehistoric trees.



## Tips for Families

### Using “Beneficial Bugs Adventure” Activities

- Before you begin your walk, be aware of any truly harmful insects in the area. Remember that many children now have serious allergies to bees, so be aware of areas where bees may be concentrated. Pick your sites carefully.
- Deliver messages about safety in a calm and low-key way. Help the children with allergies learn to stay away from the bees, and help all children learn to be safe around bees by being quiet and carefully observing. Be careful not to send messages of alarm or dislike.
- Ask children if they know what a “pollinator” is, or what they think it might be. Also discuss the word “beneficial” with children.
- Talk about the important role bees play as pollinators, as well as other insects such as butterflies and moths.
- Before heading out, take note of children’s attitudes toward insects. To foster curiosity and help overcome any negative feelings, try looking at close-up photos of insects and read both fiction and non-fiction books about bugs.
- Encourage children to take their own “field-notes” on your walk. Help them feel good about using a technique that is also used by adult scientists. Encourage children to create symbols on their field-notes in ways that are meaningful to them and represent their thinking. As they do this they are learning to be close observers, and they are learning about literacy in a “real work” way.
- Taking magnifying glasses along on your walk is an option that might help children focus, observe and enjoy this activity in a deeper way.

**NOW use “Beneficial Bugs” activities with children.**





# Beneficial Bugs Adventure

(part one)

Are you ready to be a scientist?  
Let's go on an adventure to look for helpful **bugs**.

**First**, take a walk to where insects might be and turn on all your **senses**.

## Look...



Did you know that many insects rely on their sense of smell to find food?

Flowers or plants with strong odors often attract insects.

## Listen...



## Smell...



What insects have you seen so far?



Can you use your body to imitate the way insects move?





# Beneficial Bugs Adventure

(part two)

**Now** discover more. **Choose** one type of insect to observe closely and learn more by recording your discoveries.

Here are three ways to record:

1.



**Sketch what you see.**

2.



**Build what you see.**

3.



**Create a movement of what you see.**

**Recording** what you are learning will help you remember. This is what scientists call taking “**field notes.**”



**Did you find insects on plants?** Many bugs get their food from plants, but did you know they might also be helping plants grow at the same time? It’s called pollination.



**Can you record field notes about pollinators?** .....➤

Everyone in your family can compare your field notes.





# Create a Pollinator Garden

## Talk About It

Talk with children about pollinators and what they do. (“Pollinators” is a fun word for children to learn!) Ask for their thoughts and share ideas of your own. Help children know that most plants need pollinators to help them grow.

Ask children if they’d like to help the plants and insects in your neighborhood by planting a pollinator garden.



## Steps in Creating the Garden

### 1. How big?

Decide how big you want your garden to be. There are simple things you can do to support the biodiversity of plants and insects in your neighborhood. If you are not able to create a whole garden, at least add a few pots with attractive plants. Every bit helps.

### 2. Where?

Choose an area with:

- As much sun as possible
- Water available nearby
- Shelter from the wind



### 3. What to add?

Ingredients might include:

- Native plants with scents and colors to attract butterflies, bees, hummingbirds, moths or bats.
- Mulch such as straw, wood chips or bark to keep the area weed free.
- Water and mud placed in a ceramic bowl to give insects such as butterflies a place to drink and obtain minerals. (You can tell the children this process is called “wicking.”)
- Rocks, which provide great warm places for flying insects to perch



### 4. What else?

Things to keep in mind:

- Check local sources for information regarding specific native plants, and tips for making your garden successful in your region.
- Be careful not to use insecticides near your pollinator garden. Even those insecticides that are labeled “benign” are actually lethal to butterflies.



Stewardship Theme: Animals/Bugs

# Planting a Pollinator Garden Helps Plants, Insects and People!

## Message to Families

Declines in the health and population of pollinators globally pose what could be a significant threat. The integrity of biodiversity, global food webs and human health depend largely on the pollination process.

Be careful not to worry children about the decline in pollinators. Instead, help them feel good about their efforts to help pollinators. Here is a positive message you can share with children:



**When you plant a pollinator garden, it's good for insects, plants and people. And that helps our whole world!**

Plants that people use for food, beverages, fibers and spices need to be pollinated. When you plant a pollinator garden, you help take care of the butterflies, bees, hummingbirds, moths, and bats our world needs.





## More Resources About Pollinators

### Web Sites:

[www.pollinator.org](http://www.pollinator.org)

Pollinator Partnership is a source for pollinator action in North America specifically. It includes information on the role pollinators play in biodiversity.

[www.fs.fed.us/wildflowers/pollinators](http://www.fs.fed.us/wildflowers/pollinators)

United State Department of Agriculture Forest Service is a source for information on planting and caring for wildflowers and all types of pollinator plants.

[www.nwf.org](http://www.nwf.org)

The National Wildlife Federation has information on greening school yards and back yards.



### FUN FACTS ABOUT POLLINATORS!

- At least 80% of the world's crop plant species require pollination.
- As high as one out of every third bite we eat comes to us through the work of animal pollinators.
- Foods and beverages produced with the help of pollinators include: Apples, bananas, blueberries, chocolate, coffee, melons, peaches, potatoes, pumpkins, vanilla, and almonds.
- Beetles comprise the largest set of pollinating animals due to sheer numbers. They pollinate 88% of flowering plants globally. (Source: USDA web site.)





## Tips for Families

### Using “Your Beautiful Journey” Activities

- Before you go on your outdoor walk with children, ask them what they think it means to take a journey. Consider all their ideas carefully.
- Children don’t always understand what adults mean when they use the word “nature.” Asking children what they think they might find if you take a journey together to look for nature might lead to some interesting and important discussions!
- Help children be very thoughtful about what they consider “beautiful.” Discuss together how people experience beauty in many different ways.
- Encouraging children to express their appreciation for beauty through movement, dance, drawing or painting will help them develop a deeper appreciation for the wonders of the natural world.
- Map-making is a valuable activity for children even as young as age three. Encourage children to make maps any way they choose, and resist the temptation to give too many ideas of your own. Listen to children describing their maps. Sometimes a simple mark on a piece of paper (or a line drawn in sand) may have great significance for children in representing an experience they had on their journey.



**NOW use “Your Beautiful Journey” activities with children.**

# Your Beautiful Journey

(part one)

**First**, go on a walk outside to look for nature. What do you see?



**Flowers?**



**Grass?**



**Trees?**



**Clouds?**

Can you make your body into the shape of the cloud, tree, grass, flower, rock or whatever you found?



**Rocks?**



Now **listen** for the sounds of nature. What can you **hear**?

The wind blowing?  
Birds chirping?  
Rain drops?

Can you make your **body** into a **shape** that reminds you of the sound you heard?



**(Use your imagination for this. You can do it!)**



**wind blowing**



# Your Beautiful Journey

(part two)

**Think again** about something from nature that you saw on your journey.

Can you **make a picture** of it?  
Use your picture to show other people why it is beautiful.



Will you draw in sand or dirt with a stick or your **finger**?

Will you draw with **pencil** on paper?

Will you use **paint**?

Now, can you make a **map** of your journey? .....

Show the places you stopped along the way to see or hear beautiful parts of nature.



**Use your imagination and create your map any way you want!**



## Help Others Appreciate the Wonders of Nature

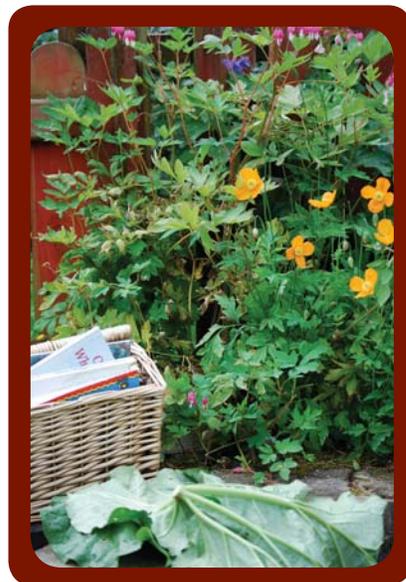
### Talk About It

Help children think about the importance of taking good care of the natural world so everyone will always be able to appreciate its beauty. Talk about things people sometimes do that can make the natural world less beautiful. (Examples: littering, damaging trees, walking on flowers, etc.) Ask children to think about something you can create in your home to show people the beauty and wonder and importance of nature.

### Ideas

There are many ways you and your children may decide to display the wonders of nature where you live.

- Display nature items on a shelf at home.
- Display artwork that celebrates the wonders of nature. If children choose, they may write messages (or dictate messages for adults to write) about the importance of keeping nature beautiful.
- Display favorite books or photographs that show the beauty and diversity of the natural world.





# Appreciating Nature’s Beauty Reminds Us to Help Keep Our World Beautiful

## Message to Families

“Children can learn many different things about natural environments. They can learn about nature as a “resource” to be used; they can learn that air, water, and sunlight are important to living things; and they can learn that elements of the natural world can be grouped into different categories, such as living and nonliving.

But the most important things that young children can learn about the Earth is that it is full of beauty and wonder. It is a sense of wonder that will serve as the strongest incentive to save Planet Earth. It is also a sense of wonder that will add immeasurably to their enjoyment and appreciation of life.’

Ruth Wilson, from her book, Nature and Young Children

Help children feel good about their efforts by sharing these positive messages with them:

**When you help people really notice the beauty in nature, you help them remember to take good care of our natural world.**

**Creating pictures, photographs, displays or sculptures is a good way to help people remember the wonders of nature.**



**When you remind people not to litter or damage trees or flowers, you are helping keep our world beautiful.**



# More Resources About the Wonders of Nature

## Web Sites:

Click here to find an activity for families called "What is Beautiful to Me"  
(Source: [www.natureexplore.org/families](http://www.natureexplore.org/families))

## Articles:

"Essential not optional" by Sue Elliot (Exchange magazine, March/April 2010)  
(Source: [www.childcareexchange.com](http://www.childcareexchange.com))

"Nurturing Environmental Awareness in Children" by Kim Hyers  
Exchange magazine Beginnings Workshop 5/99-51  
(Source: [www.childcareexchange.com](http://www.childcareexchange.com))

"Support Resilience by Connecting Children with Nature" by Karen Stephens  
Exchange Beginnings Workshop 11/99-52  
(Source: [www.childcareexchange.com](http://www.childcareexchange.com))

## Children's Books:

*Look, Look...Look Again* series  
by Claire Warden and Niki Buchan

## FUN FACTS ABOUT NATURE'S BEAUTY!

Nature's beauty can be found on many scales, from grand and majestic to microscopic.

Here are some of the most beautiful **LARGE** places in nature to show children:



Mount Everest in Nepal



Great Barrier Reef in Australia



Grand Canyon in United States

Here's a microscopic photograph of the scales of a butterfly.  
More microscopic photos of nature can be found at:

<http://photography.nationalgeographic.com/photography/photos/patterns-microscopic-earth/purple-diatoms-photography.html>

