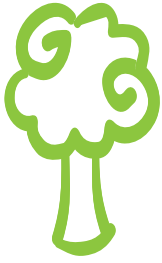


Inspiring Children's Spirit of Stewardship:



A TOOLKIT for Early Childhood Programs

Dear Educators,

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 early childhood program to focus on positive actions teachers and children 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 child, or print one teacher copy and share pictures with children. Each activity comes with "Tips for Educators."

Have an
Adventure!

2. Take Action

For each stewardship theme, teachers and children together take one action that will help "green" the environment.

Take
Action!

3. Celebrate Your Action

Talk with 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 in your early childhood program.

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. By supplementing the efforts at school with the Family Toolkit, children are given the opportunity to deepen their understandings by "teaching" their families what they learned.

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A Collaborative Project of
Arbor Day Foundation and
Dimensions Educational Research Foundation



Inspiring Children's Spirit of Stewardship:

A TOOLKIT for Early Childhood Programs

Stewardship Themes



Plants

1. Trees
2. Seeds



Energy

1. Light
2. Heat



Air

1. Trees
2. Wind



Animals & Insects

1. Bugs
2. Birds



Water

1. Rain
2. Native Plants



Human Health

1. Sense of Wonder
2. Food and Gardening



Soil

1. Composting
2. Recycling

A Note to Educators: 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 Educators

Using “You and a Tree” Activities

- Take a walk near your school or around your school grounds. Choosing one tree for the group to focus on will help you manage this activity and keep children close enough to you so they can hear your questions and suggestions.
- 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 increase their own body awareness and self-regulation abilities. These kinds of movement activities help children put information into their muscle memory and are especially beneficial to kinesthetic learners (who need to move to learn).
- 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 continue focusing on beautiful details and reinforce the idea that a tree is a living organism that needs care. 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, choose an interesting tree. Let's explore its 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

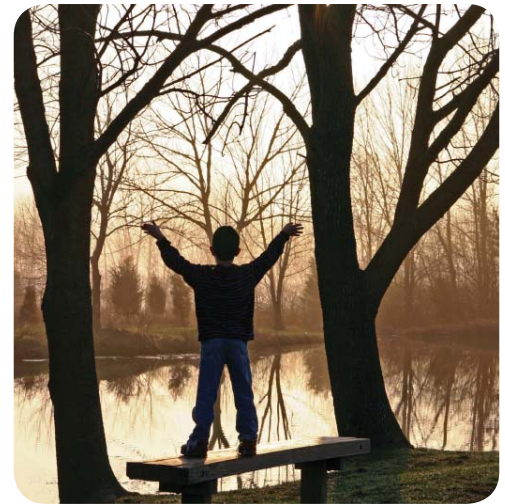
(part two)

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

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

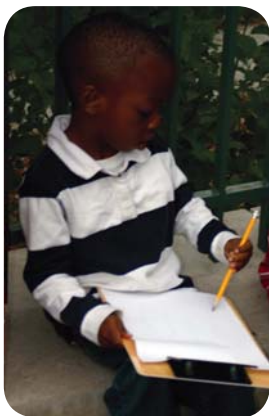
your **stomach** is the tree's **trunk**,

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 center or school grounds 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)





Caring for Trees is Good for our Earth!

Message to Educators

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)



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
(Arbor Day Foundation)

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
(Project Learning Tree)

www.treesftf.org
(Trees for the Future)

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)



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 Educators

Using “Super Seeds” Activities

- Gather a variety of seeds for children to explore. If possible, have seeds that are commonly grown locally and that are from plants children eat.
- As children look for ways to group seeds (and discover patterns and similarities), they are developing close observation skills and a sense of appreciation for the diversity of life.
- As children use their bodies to mimic the life cycle of a seed (from planting to sprouting to growing), they are internalizing their understandings. (Real-life observations of seeds going through this cycle will be more meaningful to them.)
- When children look at photographs and then see the real object (in this case, seeds), they are developing an understanding of the relationship between two-dimensional and 3-dimensional objects.
- As children sketch their ideas about seeds and plants, they are able to symbolically represent their understandings in a non-verbal format. Many young children are able to show what they know more easily than they can tell what they know.



NOW use the “Super Seeds” activities with children.



Super Seeds (part one)

First, explore your seeds.

Are they all the **same** kind of seed, or do you have many **different** kinds?

Can you sort them by **size** (from smallest to **largest**)?

How else can you **sort** your seeds?

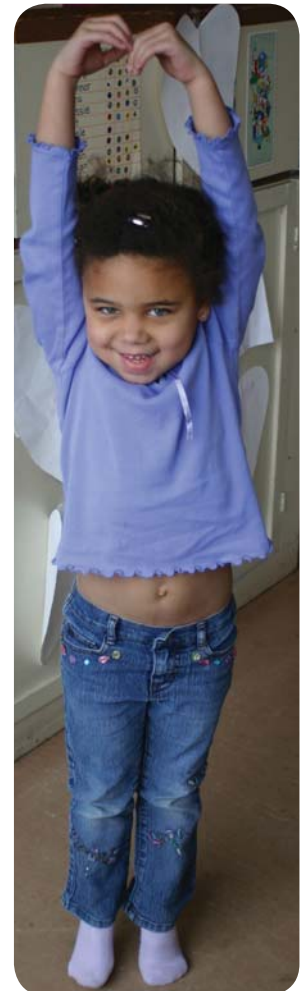
Now, pretend you are one of your seeds. (What kind of seed are you?)



Can you make your body as small as possible – like a seed planted in soil?



Pretend that you are beginning to **grow** from a seed into a plant. Can you make your arms reach up like a plant reaching for the sun?





Super Seeds (part two)

Look at these seeds and the plants they will become:



sunflower seeds



sunflower



acorn



oak tree



corn



corn on the cob

Do you know what kind of plant your seed will become?
If you don't know, how can you **find out**?



Try **drawing** a picture of your seed and the plant it will become.





Make Bread From Seeds

Talk About It

Help children understand that most people all over the world eat bread each day that comes from seeds. This is something that all human beings share, no matter where they live. Ask children what they know about how bread is made. Offer them the opportunity to participate in the process of making bread from seed to loaf. (This process will help children feel more connected to the natural world and help them see how they fit into the cycle of life.)



Make Your Own Bread

Choose a grain grown locally and bring it to your class in its most natural state. Then follow these steps:

1. **Threshing:** Help children pick grain heads off of plant stalks and collect them in a large bowl. (Make sure you help children know that these are seeds.)
2. **Winnowing:** Depending on the grain you have, you may need to remove the outer seed covering (chaff). To do this, pound the grain (in the bowl) to separate it from the chaff. Children may then gently blow the chaff away while the heavier grain stays in the bowl. When enough grain has been gathered, children will be ready to grind it.
3. **Grinding:** Use a mortar and pestle (or similar tool) to grind the grain into flour.
4. **Baking:** Use the flour to make a traditional or every day bread to eat together. See “More Resources About Seeds” for bread recipe sources.



Note: This activity may be done over more than one day’s time. You might want to thresh and winnow one day, grind one day and bake another day, for example.





Nature Provides Seeds That Help Feed Us!

Message to Educators

Helping children understand that all humans need seeds for survival helps them develop an appreciation for what nature provides, and for the interconnectedness of life. Learning about and choosing locally grown food helps children develop a sense of place and will encourage responsible consumerism in the future. Have children check their seeds with an adult to make sure they are safe to eat.

Help children feel good about their explorations of seeds by sharing some of these positive messages:

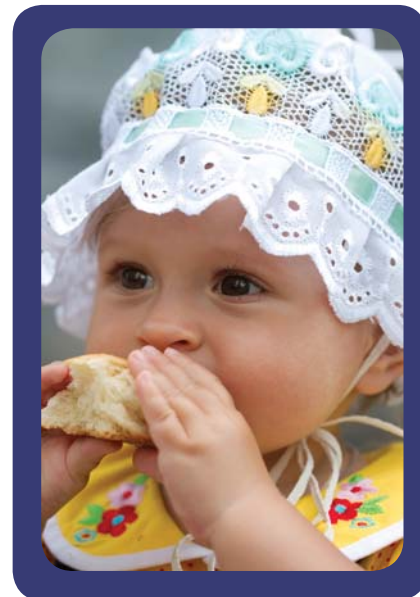
Seeds grow into plants that all humans need to help us live.

It is important that we care for seeds and plants.

Eating bread made from seeds is something people do all over the world.

No matter where we live in our world, we are all thankful for the gifts nature provides (such as seeds we can use to make bread).

We appreciate the seeds that grow in our part of the world.





More Resources About Seeds

Click here to find an activity called [“Bread Around the World”](#)
(Source: The Wheat Foods Council)

Web Sites:

www.commonthreads.org

Common Threads helps bridge cultural boundaries and strengthens our global family by teaching children about their similarities and differences in the warm comfort of the kitchen: Through the simple process of preparing and sharing a nutritious meal, children who participate in these programs learn to connect with their bodies, their neighbors, and their world in bite-sized lessons.

www.natureexplore.org

(Nature Explore Families’ Club)
Adventure Activity 14: Amazing Seeds

www.suu.edu/faculty/gubler/pdf/bread.pdf

This Southern Utah University (United States) web site has children’s books, activities, and bread recipes from around the world.

www.seedsavers.org

Since 1975, Seed Savers Exchange members have passed on approximately one million samples of rare garden seeds to other gardeners. They are a non-profit organization of gardeners dedicated to saving and sharing heirloom seeds thereby increasing biodiversity and decreasing the need for pesticides.

FUN FACTS ABOUT SEEDS!

Many people use seeds as food. Here are some popular kinds of seeds people eat:

Grasses such as:

wheat
rice
sorghum
barley
millet



Legumes such as:

peanuts
soybeans
peas
beans



What kinds of seeds do you eat?

Read more:

Seeds As Food
www.science.jrank.org

Tips for Educators

Using “Breathing With a Tree” Activities

- If you are in an environment where air quality prohibits you from doing this activity, bring a potted tree or large plant indoors to do it.
- Because air cannot be seen, it can be difficult for children to understand. Helping them realize how it feels in and on their bodies will make it real to them.
- Helping children tune into how their bodies are feeling is a foundational part of this activity and something people of all ages can benefit from. With heightened awareness comes appreciation for and curiosity about the air that surrounds us. This air is a key renewable energy source.
- This is a good activity to do on a regular basis. Children will experience it differently depending on weather, mood, and location.
- Adding plants as air cleaners is a simple activity even very young children can help with.



NOW use “Breathing With a Tree” activities with children.



Breathing With a Tree

(part one)

We are all bathed in air all the time but we don't think about it much.

Let's go outside and sit near a tree.

Try **breathing** in and **blowing** out in deep slow breaths.

You are part of a team.>



The leaves of trees and **plants breathe in** what **you are breathing out**. Plants breathe out (give off) the healthy air that people and animals breathe in.

<.....

While you breathe, think about how you and the tree are helping each other.

Does it make you smile?>





Breathing With a Tree

(part two)

Try this fun way to notice your breath and learn to control it.

Try making your body into this **Tree Yoga pose**. ➔

Think about how good your body feels as you are breathing in the **clean air** from the tree.

As you gently, slowly breathe out, you are giving the tree what it needs.

Breathing all the way out is helping you grow strong like the tree.



Now make up your **own body pose** near your tree partner and practice breathing!

Would you like to draw a picture of yourself in your tree pose? Or...maybe you'd like to **draw a picture** of your tree partner!





Bring “Air-Cleaning” Plants Indoors

Talk About It

Indoor air quality is often 2-5 times worse than outdoor air quality. Adding plant life to places where you live and play helps produce cleaner, healthier air indoors the way nature does outdoors.

The leaves of plants capture “off gasses” from furnishings, cleaning supplies, and building materials. Two plants per 100 square feet is recommended to improve indoor air quality. Some good plants (or small trees) to consider are lady palm, areca palm, English ivy, golden pathos, and rubber plant.

(Source: B.C. Wolverton, “How to Grow Fresh Air”).

Talk with children about how plants or small trees can make the air inside your school fresher and healthier. Ask for their ideas about what kinds of plant(s) or small tree(s) would be good to have at your school.



Bring Plants Indoors!

Once you’ve decided what you’d like to add, bring the potted plant(s) or small tree(s) to your school as “air cleaners!” If possible, involve children in helping to pot the plant or tree. If this is not feasible, then let the children do the watering.

Ask for children’s ideas about how you will take care of the plant(s) or tree(s). Many people find that creating a “helper chart” so children can take turns watering is a great way to foster a sense of stewardship.





Caring for Trees and Plants Can Help You be Healthier

Message to Educators

Poor air quality impacts children even more than adults. Children are more vulnerable because their lungs are still developing and they breathe more air per pound of body weight than adults.

You can help children become more aware of the air around them and how to care for it. Deep breathing and purposeful movement not only helps children learn about air, it also helps them take good care of themselves.

Proper breathing has profound effects on our health. Over 70 % of waste by-products are eliminated through our breathing and our skin.

Good breathing supports muscle growth and energy and fully oxygenates our blood. When blood is heavily oxygenated, it is more difficult for virus and bacteria to grow in our body (source: www.breathaware.com).



Here are two messages to share with children to help them feel good about their actions:

When we take care of trees or plants, they will help take care of you by cleaning the air you breathe!

When you breathe deeply and enjoy the good air that trees help clean, you are making your body healthier!



Resources About Air Quality

Web Sites:

www.onemillionactsofgreen.com

This website has lots of simple ideas for environmentally friendly practices to improve air quality and reduce our impact through good daily habits.

www.globe.gov

Global Learning and Observations to Benefit the Environment is a world-wide organization with hands-on primary and secondary school-based science education activities.

www.nrdc.org/health/kids/ocar/chap4.asp

The Natural Resources Defense Council has articles on this website that relate to air pollution and its impact specifically on children.

www.clean-air-kids.org.uk/airquality.html

This website provides information, activities and games for children related to air quality.

FUN FACTS ABOUT AIR QUALITY

- The nose plays an important part in our breathing air in and out. Hairs in your nose help to clean the air we breathe as well as warm it. The highest recorded "sneeze speed" is 99 miles per hour!
- Each ton (2000 pounds) of recycled paper can save 17 trees, 380 gallons of oil, three cubic yards of landfill space, 4000 kilowatts of energy, and 7000 gallons of water. This represents a 64% energy savings, a 58% water savings, and 60 pounds less of air pollution!
- NASA research on indoor plants has found that living plants are so efficient at absorbing contaminants in the air that some will be launched into space as part of the biological life support system aboard future orbiting space stations.
- One research study found that 60% of airborne mold in the room vanished just 6 hours after English ivy was brought in!



Tips for Educators

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. Air cannot be seen so it can be difficult to understand. Heightening children’s sense of touch is important for 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 share it with the 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, work with your teacher to attach them with string to build a mobile.

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



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

"We are all bathed constantly in air which is moving on a hemispherical if not global scale. For this reason, air symbolizes perhaps better than any other environmental factor our shared dependence on planetary properties that may seem distant from our immediate daily concerns."

—John Janovy, Jr. The Ten Minute Ecologist

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 with children about how wind has been used by humans for thousands of years for things like carrying ships, pumping water and grinding grain. Help children think about one way that everyone in our world can use wind: To help dry our clothes!

Try installing a line outdoors so children 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.)



Children could hang doll clothes (that perhaps they also helped wash), or anything else that you need to wash at your school. When you hang the clothes 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 Educators

New energy technologies are coming that will shrink our use of fossil fuels and cut emissions of greenhouse gases. Wind power is one of the fastest-growing sources of renewable energy in the world.

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

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

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

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.

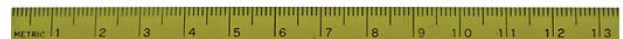


FUN FACTS ABOUT WIND

- 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 Educators

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 natural phenomena 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.
- If children or parents will be concerned about wet clothing, you might ask parents to send spare clothing or gather it yourself from used clothes supplies. (The need for this will vary depending on where you live in the world, what your climate is like, and the shared philosophy of your school/family community.)
- Encouraging children to use many words to describe how the rain feels will help boost their vocabulary.
- Support children’s divergent thinking when generating ideas for water uses. 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 class, 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.



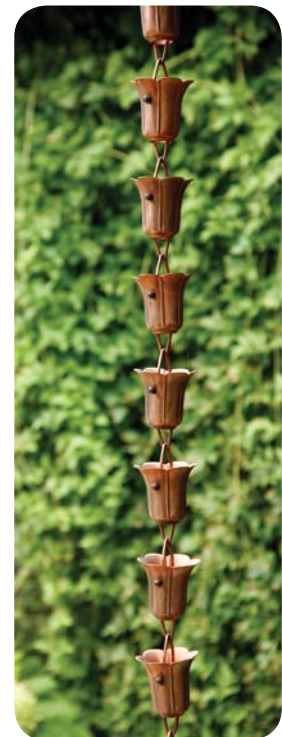
Create a Rain Catcher

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





Being Careful with Water is Good for our Earth

Message to Educators

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 and 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

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

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 Educators

Using “A Watery World” Activities

- Think carefully about whether this activity is right for your school. You will need to visit a puddle with standing water, or a pond, stream, lake, or beach, so this simply may not work in some locations. If finding the right place to visit is not an option, then enjoy the other water activity (Water/Rain) with your children.



- If you are able to carry out this activity, it will be impactful for children to see how the ecosystem of the watery place compares to the ecosystem of their school yard. This will help children develop a sense of place and know their surroundings more completely.
- Before you set out on your trip, discuss the guidelines for keeping safe around water.
- Encourage children to use their senses, especially near the water. Often smells are stronger there, and the sense of smell is linked to forming powerful memories.
- If possible, bring dip nets with fine mesh to skim water and/or buckets to temporarily collect small amounts of water and see what you can find.
- Be sure to model respect for the natural world by returning the water, and any insects children have collected, back to where they were found.
- Don't worry if you cannot identify all the insects and plants children are finding. This can be part of the learning process. Children can make up their own names to help them remember and may be interested in looking up the scientific names later. This can be a great link to literacy!

NOW use “A Watery World” activities with children.



A Watery World

(part one)

Can you **find a pond or stream** near your school.? Watery worlds are fun, interesting places to observe.

Water in ponds or streams can be home for many living things. What do you notice in the watery world you are visiting?

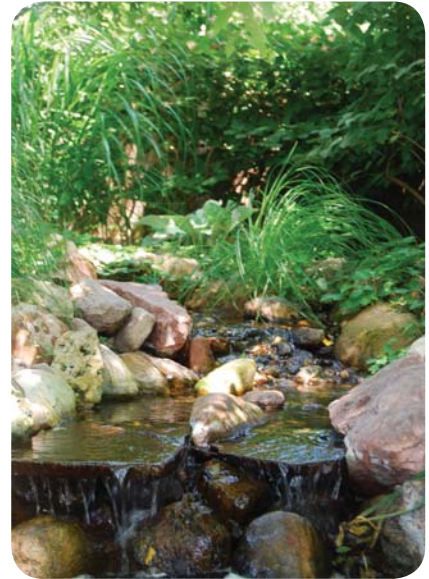
Do you see anything moving?



Can you **move your body** the same way the creature you found was moving?➔



Be respectful of what you see and be sure it gets back to its home!



One way to observe is by using a **dip net**.



Try dipping in an area near weeds or plants because they make good hiding spots for creatures.



You might want to look at the water with a **magnifying glass**. Does it help you find living things?

Try sketching what you are seeing.



A Watery World

(part two)

Are there **plants** growing in or nearby the water?

Why do you think the plants grow there?



Did you guess that the water is helping the plants grow?



Did you know the plants are also helping the water?



Roots help clean the water. A great thing about plants is that they help clean the water we all need!

Different types of plants need different amounts of **water**.

Nature has provided special plants called **native plants** that belong in the space where they grow best. They use just the right amount of rain water that naturally falls here.





Use Native Plants

Talk About It

Access to clean, fresh water is a pressing problem around the world. There is no “new” water and every time we use it there is a chance it will be polluted. Fish, animals, and people all need it to survive. Most of us take the water we use for granted, but fresh water isn’t easy to come by. The water we drink is the same as the water the dinosaurs drank.

Talk with children about choosing some plants for your schoolyard that are “native” to their surroundings. Ask them what they think the word “native” means, and discuss together.

Let children know that native plants are mostly happy with the amount of rain that falls naturally in your area. That means they don’t need us to give them lots of extra water. (That helps us all save water!)



Choose a Native Plant for Your Schoolyard

Involve children in helping to choose and plant a native plant in your schoolyard. Plan carefully for the activity so that each child has a role. Once planted, children could be invited to continue interacting with the plant by:

1. Giving it a special name.
2. Drawing a picture of it in its new home.
3. Checking to be sure that it is staying healthy. (Let children know that even native plants might need a little extra water when they are first planted. Once they have been growing for a while, though, they can mostly survive on rainwater.)





Using Native Plants Saves Water!

Message to Educators

Every drop of water counts. Millions of people spend their days carrying water. In fact, 46% of people on earth do not have water piped to their homes. Yet water is crucial to survival for us all.

The average person can survive nearly two months without eating, but less than a week without water. If everyone makes small changes in how we use and care for water, we can make a large collective difference.

Planting plants that do not require extra water is a great small step!

Help children feel good about their efforts by sharing the following positive messages:

When you put native plants in your schoolyard, you are helping save water. That's important!



Your native plant will help clean our groundwater, too. That is very good for our earth!



More Resources About Water

Web Sites:

www.waterforpeople.org

A global nonprofit supporting long-lasting access to water and sanitation. Their mission is to build a world where no one suffers or dies from a water or sanitation-related disease. They operate in Africa, Asia, and Central and South America.

www.wateradvocates.org

Water Advocates is the first US-based nonprofit organization dedicated solely to increasing American support for worldwide access to safe, affordable and sustainable supplies of drinking water and adequate sanitation. Their purpose is advocacy.

www.nrcs.usda.gov

The United States Natural Resources Conservation Service helps you learn more about water conservation where you live and work through “Backyard Conservation” tips in both English and Spanish.



FUN FACTS ABOUT WATER

- Less than one percent of all the water in the world can be used for drinking. Nearly 97% is salty, and the other two percent is frozen in ice caps and glaciers.
- The percentage of water on earth is approximately the same percentage of water in your brain (75%). An elephant and a chicken are also made up of about 75% water.
- Letting a faucet run for 5 minutes uses about as much energy as letting a 60 watt light bulb run for 14 hours.
- Some plants have changed over time to use very little water. Cacti, with thick stems, and leaves reduced to spines, are one of the best examples of plants well adapted to extremely dry environments.





Tips for Educators

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 children dress appropriately. Let families know in advance what you will be doing.

- In some parts of the world, it is difficult for families to wash clothing often. If this is the case, be sensitive to this reality. Children can still do the mud activity in tubs without having to soil clothing.
- If families are able to provide old clothes for children to wear during this activity, then a more full-bodied approach may be appropriate.

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 with your friends and your teacher
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 Educators

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

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

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

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

www.nwf.org

(U.S.) National Wildlife Federation

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: urbanext.illinois.edu)





Tips for Educators

Using “Soil Safari” Activities

- Children need our help to understand what not to put in soil. We recommend that before you do this activity, you first experience the “Let’s Dig In” activity (from Stewardship Theme: Soil/Composting). That way, once children have played in and worked closely with soil, this activity will be more meaningful.
- Look in your community to see what your local government, businesses, and agencies are doing with recycling. Many places are setting up “Reuse Centers” to deal with construction waste, used appliances, and other materials to be reclaimed.
- If you have a safe way to do this, go on a walk with children and collect the items you find that are litter, or don’t belong. Some educators provide latex gloves for children to wear for this type of activity.



NOW use “Soil Safari” activities with children.



Soil Safari

(part one)

Go on a **“Soil Safari”** searching many places for soil.

Where can you find dirt (soil)?
What is happening there?

The dirt we see is called **topsoil**.
You can think of it like the **Earth’s skin**.



You might see evidence of **insects** or animals in the dirt. What do animals do with soil?



Create a movement or body shape that shows what you see.



Soil Safari

(part two)

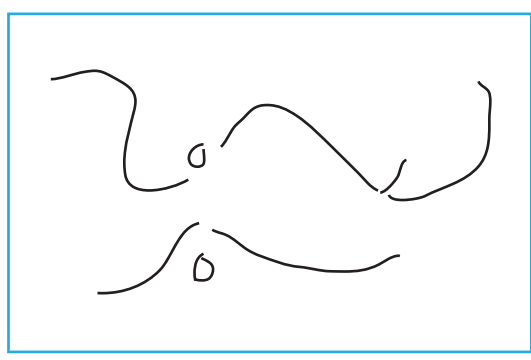
Does the dirt look **healthy**?



Do you see anything that doesn't belong in the dirt? Pick up any **litter** that you find.



Make a **"map"** of your "Soil Safari" walk?





Pick Up Litter...And Recycle!

Talk About Litter

Help children think about how needless litter is bad for our soil. Talk together about finding new and fun ways to reuse objects, which you would otherwise throw away. One way to keep our soil healthy is by picking up litter when you see it. Another way is by not wasting and throwing things away when you could recycle them instead.

Go on a Litter Walk

Encourage children to take a walk around your school to look for litter that can be recycled. You might want to hold a large bag as you walk, and ask children to bring you items to put in the "Recycling Bag."



Talk About Recycling

We need to make recycling meaningful to children by reusing as much as possible. Children can use their creativity to devise ways to reuse items.

Create a Reuse Station in your School

- Collect items that you typically would throw in the trash and create a space to keep them. (Be sure not to keep any items that would present a health hazard to children.)

Make A Recycled Sculpture, Bird Feeder, or Musical Instrument

- Once you've collected items to recycle (such as cardboard boxes or clean plastic containers), encourage children to create something useful, beautiful or musical out of these objects.





Recycling is Good for Everyone!

Message to Educators

Recycling preserves natural resources and reduces land and water pollution. Recycling and reusing items reduces the need for landfill space and the energy costs associated with that. The series of activities children just experienced will help them begin to see the damage waste does to the soil. We began by looking at what does and doesn't belong in and on soil. We concretely removed litter. Then, we created something useful out of recycled materials.

Our goal is to help children see the bigger picture and think about what is healthy for the earth and what actions they can take that will help improve quality of life.

Share these positive messages with children:

You are helping keep the earth healthy by picking up litter!

When you created something useful, beautiful or musical out of recycled materials, you helped our world.



Thank you for recycling!



More Resources About Recycling

Web Sites:

www.asla.org

This American Society of Landscape Architects website has information on creating green roofs. A green roof replaces traditional roofing with a lightweight, living system of soil, compost, and plants. It creates a thin, green skin atop a building that gives a little something back to the world.

www.arvindguptatoys.com

This web site has photos of toys made from trash. It also has lists of web sites in several languages that encourage creative repurposing of everyday household items.

www.epa.gov/recyclecity

This United States Environmental Protection Agency website has information, recycling tips, and games to help children understand how cities handle waste management.

www.kab.org

This Keep America Beautiful web site contains tips, tools and resources to help individuals improve their community through recycling efforts.



recycled musical instruments



recycled toy car

FUN FACTS ABOUT RECYCLING

- Recycling one aluminum can saves enough energy to run your TV for three hours. (source www.resourcefulschools.org)
- Old scrap paper of all kinds can be used to make new paper towels and tissues, egg cartons, fruit trays and flower pots. (source www.resourcefulschools.org)
- It takes about 45 seconds to shred the average automobile into fist-sized pieces of steel for recycling. (source www.recycleroom.org/fun.html)
- Five recycled plastic bottles make enough fiberfill to stuff a ski jacket. (source www.montgomeryschoolsmd.org)
- In one acre of land, five to ten tons of animal life are thriving. (source www.earth911.com/recycling/garden/dirt/facts-about-dirt/)



Tips for Educators

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! Be sure to have enough materials so that each child can participate.
- 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 Educators

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

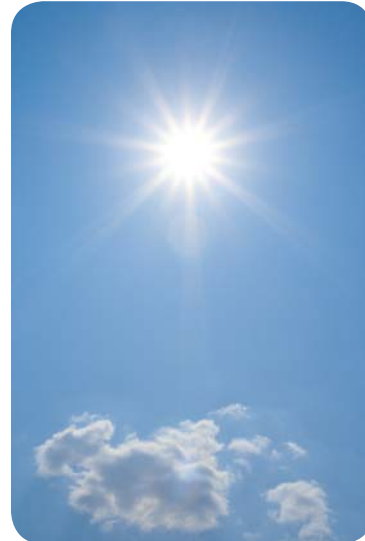
Web Sites:

www.discovertheforest.org

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

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 Educators

Using “A Heat Power Adventure” Activities

- Choose a sunny day and a location where you can find both sun and shade.
- This is a simple activity, but do not underestimate the learning value of experiencing this scientific concept in a playful, sensory way. Children need to feel the heat of the sun themselves to help them understand the powerful heat energy the sun provides.
- Before you begin this activity, be sure there will be rocks for children located in both sunny places and shady places. If needed, add rocks to both locations. A dense natural item, like a rock that has been in a sunny place for awhile, will absorb enough heat energy for children to feel the difference when compared to a rock in shade.
- The creation of a Sun Power Story is an important piece of this activity. It is how children are synthesizing or making sense of what they are learning. It is also a way to help you authentically assess what children understand.



NOW use “A Heat Power Adventure” activities with children.



A Heat Power Adventure

(part one)

First, take a walk on a sunny day so you can feel the sun's heat power.

Can you feel the heat on your **arms**?
Your **face**?
How about your **hair**?



Now find a place where you see shadows and go stand there. Close your eyes and think about how you feel.



Can you feel how the shadows block some of the sun's heat power?
.....

Let's try an experiment.
Let's look for rocks that are in **sun** and rocks that are in **shade**.

Go touch a rock in the **shade**.

Now go touch a rock in the **sun**.



Which rock is warmer?

Can you feel how the sun's energy power gave heat to the rock in the sun?



A Heat Power Adventure

(part two)

Now create a story about the power of the **sun**.

Share your story in your own special way.



Will it be a song?



Will it be a picture?



Will it be a dance or some other kind of movement?



Will it be a poem?

Share your Sun Power Story with your friends.





Be a Sun Scientist!

Talk About It

Talk with children about ways to use the sun's energy to help us every day.

Help children consider when it is a good thing for the sun to heat our school and homes (on cold days). Help them think about when we want to block some of the sun's heat energy (on very warm days). Encourage children to be "scientists" to find where the sun is heating your school.



Find the Sun's Heat Energy

1. Go on a walk with children to find all the places the sun is heating your school. (Stand by windows, for example and feel heat from the sun coming into your school.) Think about ways children can help the sun's energy work best.
2. Close blinds or curtains in the middle of the day to block the sun's heat energy (if it is getting too hot inside).
3. Open blinds or curtains if you want to get as much of the sun's heat energy as possible (on cold days).
4. Encourage children to be problem-solvers and think of ways they can do the same kinds of things at their own homes.





Stewardship Theme: Energy/Heat

Using the Sun's Heat Power Wisely Helps us All!

Message to Educators

Children can be enlisted at a young age to help conserve energy. Messages about positive environmental steps are much better for children than messages about frightening environmental problems.

Encouraging children to think about the powerful heat coming from the sun's energy will help children develop a sense of respect and wonder for the natural world.

Here are some positive messages you can share with children:

You can help the sun's heat energy work better at our school by opening window shades when we want to bring heat inside and closing window shades when we want to keep heat out.

Helping the sun's heat energy work better is a good thing for our world! You are helping to do what is called "conserving energy!"





More Resources About Energy from the Sun

Web Sites:

www.cdproject.net

The Carbon Disclosure Project launched in 2000 to accelerate solutions to climate change by putting relevant information at the heart of business, policy and investment decisions. Their mission is to harness the collective power of corporations, investors and political leaders to accelerate unified action on climate change.

www.plt.org

The Project Learning Tree web site has an annotated bibliography of energy education web sites that is just a sample of the many resources available to assist educators and students in learning more about energy. It provides information from a variety of perspectives.

www.nature.org/initiatives/climatechange/

The Nature Conservancy is joining with policy makers, community members, businesses, scientists, industry leaders and others to slow the pace of climate change. This web site has information on harnessing solar energy and reducing greenhouse gas emissions.

www.childcareexchange.com/eed

This [Exchange EveryDay](#) article “What Color is Your Roof?” helps you learn more about changing the solar reflectance of your roof to wisely use solar energy.



FUN FACTS ABOUT ENERGY FROM THE SUN!

- Do you know how huge the sun is?

More than 100 Earths could fit inside the sun. It looks small in the sky because it is 93 million miles away from Earth!

- Did you know that the practice of changing solar reflectance on built surfaces has been something people have been doing for thousands of years?

Increasing the amount of light reflected off surfaces back into the atmosphere has many benefits. For example, cool roofs reduce energy use in air-conditioned buildings, cools pavement, and improves outdoor air quality and comfort. (source www.good.is)





Tips for Educators

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.
- During your walk, help children notice that there are many types of insects in a single habitat. This will help them begin to understand and appreciate biodiversity. If you are able to visit a variety of places (some more “wild” than others) you will be able to observe that the “wilder” spaces have a more diverse and plentiful insect population. This may inspire you to create a “bug-friendly” habitat around your school.
- 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?➤

When you go back to your school, you and your friends 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 school 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 schoolyard. 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 Educators

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

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

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

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 Educators

Using “For the Birds” Activities

- Before you begin part one of this activity with children, look around your school to find places where you might find birds or bird’s nests. Finding birds living in your shared environment is key to this activity. If that is simply not possible, you may want to only do part two of the activity.
- Before you begin part two of this activity, show children real nests so they can see what materials might be used and how nests are constructed. If no real nests are available, be sure children look at the photos on the adventure sheets.
- One possible extension of this activity is to pretend that your entire class is a group of birds that are migrating. Talk about what birds do when they migrate, then set up a “migration route” you can follow around your school. Figure out where you will stop along the way to do things migrating birds need to do such as find food and shelter and places to rest.
- Having direct experience in nature helps children learn to do what scientists do: observe the natural world and ask questions about what they see then share what they learn with others. This activity will help children begin to see how birds are connected to nature in the same ways that plants and people are. It will help to foster compassion for other living things.



NOW use “For the Birds” activities with children.



For the Birds

(part one)

First, let's go on an adventure to find birds around your school. Here are some places to look:

In trees...



In a marsh...



In the sky...



On a rooftop or pole...



In a hole in a tree...



Did you find any birds or bird's nests? If not, don't worry.

You can pretend to be a bird yourself (see next page).



For the Birds

(part two)

Now it's your turn to **pretend** to be a bird so you can build your home.

Search for and **collect** things you will need to build your nest.

Can you find:

Sticks?



Twine?



Grass?



Yarn?



What will you use? (Birds often use sticks, grass or mud for their nests.)



Will it be large or small?



Here are some pictures of real nests:



What is something soft you will put in the inside of your nest?

Birds work hard to build nests that keep them safe and warm.



Help Birds Build Their Nests

Talk About It

Hands-on experiences and close observation of birds and their habitats help children see and understand the ways that birds need to use what they can find from their local habitats to build their homes. Increasing awareness of the roles we can play in protecting and enriching bird habitats will help children become better stewards of our earth.

Invite children to work together to create an outdoor “nest building station” that might be helpful to birds when they build nests.

Create a “Nest-Building Station”

- Invite children to think of colorful, soft items you might have at your school that could be recycled into nest-building materials for birds. Some possible ideas: yarn, ribbon, strips of fabric.
- Encourage each child to find at least one or two items.
- Help children donate their items to the birds by finding a place outdoors to display the soft and colorful materials. Children might want to weave the materials through a grapevine wreath, put them inside a mesh bag or in an open cardboard box. This will allow birds to come take the items when they need them.
- Be sure to encourage children to watch this station over time. Do they see birds taking materials? Do they notice that some items disappear (even if they haven’t seen birds take them)? Talk about what children think is happening.
- Later, help children check all around the area to see if you can find nests that contain your items.

Want to do more?

For a longer lasting impact, try researching native plants that can be added to your outdoor spaces that might provide more food, shelter and nest-building materials for local and migratory birds





Helping Birds is Good for Our Earth

Message to Educators

Talk with children about the interconnectedness between plants and animals, and the role we humans can play in supporting both. Help children feel good about their efforts to support birds by communicating these positive messages:

When you provide materials that can be used for nest-building, you are helping birds stay healthy!

Birds help people stay healthy, too!

Birds help with pollination, distribution of seeds and birds eat insects that are harmful to plants.

Birds are an important part of our earth's ecosystems (like forests) that provide people with food and medicine.





More Resources About Birds

Web Sites:

www.ngm.nationalgeographic.com/geopedia
GeoPedia is a companion site to National Geographic Magazine and is a good source for information on birds.

www.audubon.org/bird
Audubon Society provides scientific information and guidance on bird conservation. It also has more information on how to create healthy outdoor environments that attract birds.



FUN FACTS ABOUT BIRDS!

1. Did you know there are many types of bird's nests? Here are some fun names for nests:

Scrape
Burrow
Cavity
Adherent

(Source: www.people/eku.edu/ritchisong/birdnests.html)

2. Did you know Blue Tit birds love to weave good-smelling (aromatic) plants into their nests to help keep their homes clean and bug-free when they are raising their baby chicks? Some of their favorite plants are:

Lavender, yarrow, curry, and mint.



lavendar



mint



yarrow



Tips for Educators

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 classroom 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 in your indoor or outdoor classrooms.

- **Display nature items that children bring** from home or collect on walks or on your school grounds. Encourage children to select carefully, and to bring items they find particularly beautiful.
- **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.
- **Display nature items to create** an environmental sculpture. Look at some of the works of British sculptor and environmentalist, Andy Goldsworthy, for inspiration. (See the Andy Goldsworthy Digital Catalogue at www.goldsworthy.cc.gla.ac.uk)





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

Message to Educators

"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)

Children's Books:

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

Articles:

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

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

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

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



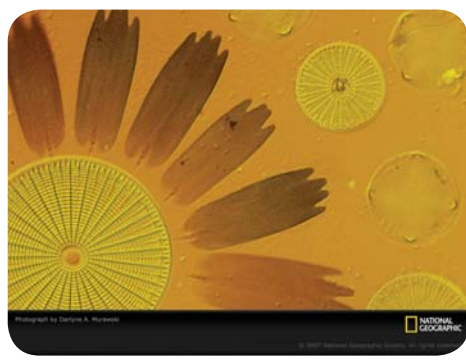
Great Barrier Reef in Australia



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>



Photograph by Barbara A. Rice
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Tips for Educators

Using “Rainbow on My Plate” Activities

- By introducing children to the pleasure of a “rainbow” of foods, you are also helping them learn about healthy eating and the value of biodiversity in plants.
- For part one of this activity, try to choose mostly fruits or vegetables that are available locally, if possible. Try to have at least three color selections available for children.
- Think carefully about how you will set this activity up ahead of time. If children are old enough, they could help cut the fruits or vegetables into bite-sized pieces. With younger children, adults may want to do this in advance.
- Place different colored foods in separate bowls, with a large spoon in each bowl. Pass the bowls around and encourage children to serve themselves “family style.” Encourage children to try all the colors, but talk about taking small helpings of each.
- Give each child an individual plate and spoon so they can create their individual “rainbows” on their plates. Support children in creating other kinds of designs with their food, if they wish, then encourage them to enjoy eating their designs.
- Be sure children have clean hands when they begin.
- For part two of this activity, keep at least one each of every fruit or vegetable in its natural state (as close to how it looks when it is growing).



NOW use “Rainbow on My Plate” activities with children.

Rainbow on My Plate

(part one)

Let's make a **rainbow** of food on our plates!

Do you know the names of the foods?



Do you know that your body is healthiest when it eats foods with lots of different colors?



Pass around your bowls of food and **take a little bit of each color** to put on your plate.

Move your food around with your spoon to create a **colorful rainbow**.



Or...maybe you will **create a different design**.

Now **EAT** your colorful design. **YUM!!**



Rainbow on My Plate

(part two)

Your teacher has fruits and vegetables that haven't been cut up yet. Can you match those to the cut up pieces you just ate?

Tomatoes



Kiwi Fruit



Aren't we lucky that nature provides foods with lots of good colors and tastes for us to eat?

Which is your favorite color of food to eat? Do you know what it is called?

Can you draw a picture of the favorite fruit or vegetable that you tried?



Will you draw with pencil or crayons? In the dirt? or with chalk?



Plant a Rainbow in a Container Garden

Talk About It

Help children choose vegetable seeds or small plants that can be planted in a container. Talk with children about choosing more than one color of vegetable so they can create a “rainbow” of foods in their container garden.

Now Plant

1. Choose a container. Planter boxes, wooden barrels, hanging baskets and large flowerpots work well.

Consider the following guidelines when choosing your container:

- Avoid containers with narrow openings.
- The size and number of plants to be grown will determine the size of the container used. Deep rooted vegetables require deep pots.
- Make sure your pot has adequate drainage. Holes should be 1/2 inch across. Line the base of the pot with newspaper to prevent soil loss.
- In hot climates use light-colored containers to lessen heat absorption and discourage uneven root growth.
- Set containers on bricks or blocks to allow free drainage.
- Line hanging baskets with moss for water retention. Keep baskets away from afternoon sun.
- If you choose clay pots, remember that clay is porous and water is lost from the sides of the container.

2. Add a Growing Mixture. Make sure your planting mixture drains rapidly but retains enough moisture to keep the roots evenly moist.

If you have compost, that could make an excellent potting soil.

Check the requirements of the plants you grow to see if you will need to add sand. If compost is not available, purchase a good quality potting mixture or make your own from equal parts of sand, garden soil (and peat moss if available).

When you add your soil to your container, leave a 2 inch space between the top of the soil and the top of the container. You will be able to add 1/2 inch or so of mulch later.

3. What to Grow? Here are some ideas:

Beans (snap or lima), beets, broccoli, cabbage, carrots, cucumber, eggplant, spinach, squash, tomatoes, zucchini

Source: Guide to Container Gardening

www.gardenguides.com/685-guide-container-gardening.html



Growing Healthy Food is Good for People and Our World

Message to Educators

The early years are ideal times for establishing healthy eating habits. When children grow their own food they are more likely to want to taste what they have grown. Fresh fruits and vegetables provide vitamins, minerals and fiber without too many calories. These nutrient-dense foods should be part of a healthy diet for children.

Establishing a personal connection to plants that provide food fosters an emotional link to healthy eating.



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

- When you eat food that you have grown yourself, your body will be healthier.
- Eating fresh fruits and vegetables gives your body nutrients that helps it grow bigger and stronger.
- When you plant different kinds of vegetables, it helps our world become healthier, too.
- Your container garden will add to the biodiversity of plants in our world, and that is a very good thing!
- It is good to grow food locally.
- When you eat food from your local area, you are using less of our world's resources by not having to fly food in on an airplane or bring it far distances on a truck.



More Resources About Healthy Food

Web Sites:

www.recipeatlas.com

Recipe Atlas (Online World Recipes)

www.cphn.org

Why Child Care Matters for Obesity Prevention
(University of Washington Center for Public Health)

www.earlysprouts.org

Early Sprouts: Cultivating Healthy Food Choices



FUN FACTS ABOUT HEALTHY FOOD

- Did you know that tomatoes are considered a vegetable by some people and a fruit by other people? They are also one of the most popular foods in the world.
- Did you know that soybeans are eaten by over 2/3 of the people in the world?

