# Mysterious Encounters Earth

## Optional
## Follow Through Activities

**by Alan Warner**
**School of Recreation Management & Kinesiology**
**Acadia University**

This information package provides some additional activity ideas which can be used to further develop the concepts of "touch", "know", and "care" after the trip. There are multitudes of possibilities and resources available, and you may well have developed your own ideas and/or want to use your own resource books. Please share your ideas and activities with us and we can add them to this packet in future years! Please relate the activities to the touch, know, and care categories in order to reinforce these concepts and encourage students to use them in the future. Please call if you need assistance.

You may notice that the "touch" activities throughout the program typically involve work in the outdoors. We feel it is critical that students' experience nature if they are to appreciate it, although we recognize that organizing such experiences presents logistical problems for any class. In contrast, it is quite possible to lead effective know and care activities within the classroom or school. The activities in this packet are:

## Touch

**Earth Walks:** 4-6 short outdoor activities combined in a flowing way to provide a "special adventure in experiencing the richness and wonders of the natural world.

## Know

**Bottle Earth:** Students build a mini-terrarium and consider the water cycle in relation to plants and photosynthesis.

**Oxygen Factory**: An excellent demonstration of plants actually giving off oxygen during photosynthesis.

**Air Pollution:** A simple demonstration of the unseen but concrete effects of the air pollution around us.

**Car Pollution:** A simple, concrete demonstration of the amount of dirt cars spew into the atmosphere every minute.

## Care

**3 Things I Can Do:** Page 20 in the Investigator Notebook asks students to come up with 3 things they can do to care for the earth.

**Lorax Challenge:** Uses a fun book by Dr. Seuss, The *Lorax,* as a means for students to consider their role in environmental problems through their lifestyle.

**Community Involvement:** An activity in which students identify areas near their school which have been damaged by erosion, trampling, etc. They then come up with ways to restore the area and implement them.

**Back to the Earth—Biodegradable Items:** An activity to increase awareness of biodegradable versus inert items and the consequences of throwing them out as garbage.

**Garbage Test:** A simple activity to make students more aware of the garbage they create with their lunches or snacks, and encourage them to reduce it.

# Touch Activities

## Earth Walks

An earth walk is a "special adventure in experiencing the richness and wonders of the natural world. It is a light refreshing way of feeling nature. The emphasis is upon re-awakening individual senses and sharpening perceptions" (from *Earth Walks* by Kirk Hoessle and Steve Van Matre). The morning activities on the trip (leaf slides, the underworld, getting to know a tree, scratch and sniff, and listening to the symphony) were organized as an earthwalk although the leaders did not use this term. They were "a series of special activities, usually four to six, put together in a smooth flowing way. An earth walk provides just a touch of nature, a new way of looking at familiar things, and an interesting introduction to unfamiliar things as well." Earthwalks are a powerful way to develop student's appreciation of the natural world, to put them in "touch with the earth."

If you plan to do an earthwalk, you should get hold of a copy of *Earth Walks* which lists activities and provides detailed guidance on leading them (Institute for Earth Education, Box 67060, Northland Village P.O., Calgary, Alberta T2L 2L2, + $26.95 shipping & GST). The Halifax Teachers Resource Centre has a copy as do many other districts in their resource libraries. There is a copy at the Outdoor Centre. Here are some possibilities for doing an earth walk with your class.

• A particularly valuable idea would be to help your class prepare a series of activities using the necessary props in which each student would lead a child in a class from a younger grade level (e.g., grade 1) through these earth walk activities outside under your supervision. You could use the same activities they experienced on the trip. The students could each make the required props with materials they could retrieve from home (the props are easy to make and directions are included with the activity descriptions).

The activities could be repeated with just your students first as a prelude to preparing them to work with the younger children. Possibly your class has worked with a younger class already via reading buddies. You might do the outdoor experiences in two sessions so that you would only have half of your class and half of the younger class outside at a given time (the others might be reading inside). You may have to adapt the presentation of the activities in the write ups to suit this cross-age approach.

• A second option would be for the students to simply make their own props and then they would repeat the sort of earth walk they did on the trip in a different spot under your leadership.

• A third option is that the Outdoor Centre has an Earth walk kit with different activities in it, which you could borrow to do a different earth walk with your class.

# Know Activities

## Bottle Earth

An activity in which students build a mini-terrarium and consider the water cycle in relation to plants and photosynthesis. It builds on Food Factory and communicates that the amount of water on earth is limited and cycling.

**Items You Will Need**

- a large bottle with gravel in it
- envelope with instructions
- a clear plastic bag
- an indoor plant with sizable leaves
- potting soil and some small plants

(this can be done in small groups if there are extra materials, then students can observe their own gardens over days)

**What to Do:**

1. Tie the plastic bag around the leaf of the plant a couple of hours before you plan to introduce the bottle garden activity. Water will become visible on the inside of the bag. Have the students discuss why and review photosynthesis as they experienced it in the food factory....A certain amount of water escapes from the leaf before it can be used to make sugar. This water becomes visible when a bag is over it. This condensed water can be used again by the plant if it is absorbed through the roots.

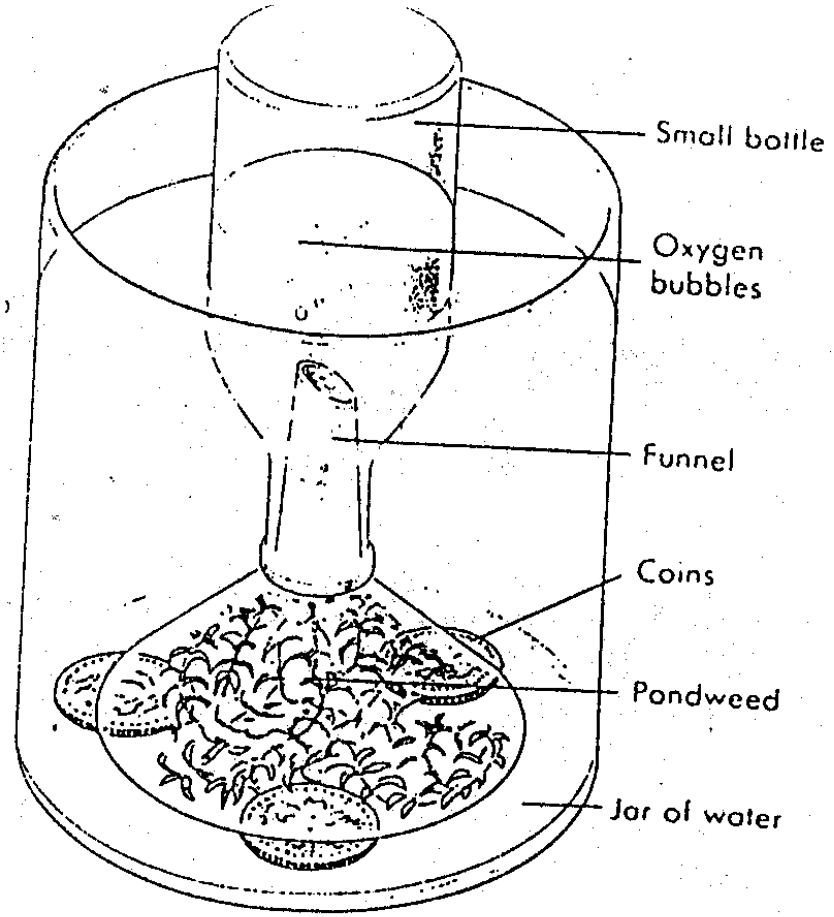
2. A **bottle garden** uses the water in the same way. Put some gravel or small stones in the jar and lay it on its side. Add a layer of damp potting soil. Pick some small plants and press them into the soil with a long stick; attack the lid tightly. Put the jar in a lighted place, but not in direct sunlight. The plants in the bottle use the water ($H_2O$) in the soil and the carbon dioxide ($CO_2$) in the air to make sugar. They give off oxygen ($O_2$) as they do this. At night when there is no light to help photosynthesis, the plants use the energy in their food stores and give off water and carbon dioxide..

3. Note and discuss that your bottle garden is like the earth - the total amount of water stays constant. No water arrives or leaves the system so we need to take care of what we have. There is only one thing that reaches the earth from outside and that is sunlight.

# Oxygen Factory

An excellent demonstration of plants actually giving off oxygen during photosynthesis. It builds very well on the Food Factory activity from the trip.

**Items**
- a large bottle or plastic tub
- a clear funnel or something else which fulfills the function
- pondweed, underwater plants
- a smaller plastic bottle
- thin spacers




**What to Do:**

1. Arrange the equipment as in the illustration. Start the experiment in bright light and watch to see if bubbles start forming. Move the experiment to a shady place and see if the bubbles appear more or less quickly.

2. Discuss with the students what is the gas in the bubbles. Have them remember what came out of the leaf in the food factory in addition to sugar.

# Air Pollution

A simple demonstration of the unseen but concrete effects of the air pollution around us.

**Items Needed**
- 8 natural rubber bands
- 2 coat hangers bent into rectangles
- a plastic bag
- a magnifying glass

(this can also be done in small groups if students contribute some hangers and rubber bands, in addition to those in the boxes)

**What to Do:**
1. Bend each coat hanger into a rectangle.

2. Slide 4 rubber bands on to each coat hanger, making sure they are stretched tight. If they are not tight at first, bend the coat hangers until they are.

3. Hang one outside in a shady place so it is out of the sun. That's important.

4. Put the other coat hanger in a plastic bag, seal it tightly, and keep it indoors in a drawer.

5. Wait at least a week.

6. After a week, check out the rubber bands hung outside. Are they cracked or broken? Use the magnifying glass to look at them carefully.

7. Compare the rubber bands hung outside with those kept in the bag by stretching each group the same distance. Is there any difference?

8. If the rubber bands from outside are still in good shape, hang them back up and keep them there for a few more weeks. See what happens to them over a longer time.

**Observations**
- If the air is clean outside, it will take a long time for the rubber bands to show damage. But if the air is polluted, the rubber bands will break in a few weeks. That is because there is unseen smog and air pollution which has been eating a way at them.

- Have students discuss what causes air pollution, how they create air pollution, and what they can do to reduce the air pollution that they create.

(this activity comes from *50 Simple Things Kids Can Do to Save the Earth*—p.144)

# Car Pollution

A simple, concrete demonstration of the amount of dirt cars spew into the atmosphere every minute.

**Items Needed**
• three strips of thin white cloth and three rubber bands

(this can also be done in small groups if there are extra materials, it also could be done at home but an adult should supervise)

**What to Do:**

1. Discuss with students whether they think cars create a lot of pollution. Get them to try and express how much dirt they are putting into the air.

2. Go outside and use the rubber band to place the cloth around the opening at the end of a car's exhaust pipe. Turn the car and leave it on for 15 seconds. Turn the car off and examine the cloth. Try two other cars to see if one car seems to spew more dirt than another.

3. Discuss the impact of cars and ways to reduce the pollution. Have the students come up with their own ideas. Have them discuss what they can do.

*Facts about Cars:*
• Cars and small trucks give off 20% of all the carbon dioxide that comes from burning oil, gas, and coal. This carbon dioxide is heating up the planet through the "greenhouse effect."
• The more gas a car uses per kilometer, the more carbon dioxide it gives off. A car which goes 25 kilometers on a gallon of gas gives off a ton of carbon dioxide every 2500 kilometers.
• Cars give off 34% of the nitrous oxide into the atmosphere, which is one of the key things that create acid rain.
• Cars give off 27% of the hydrocarbons that cause tree killing and lung damaging ozone smog. The more fuel used, the more smog.

# Care Activities

## 3 Things I Can Do

Page 20 in the Investigator Notebook asks students to come up with 3 things they can do to care for the earth. One possibility is again to use these open ended homework or optional assignments for the students. A second option is that you could combine their own ideas with particular things you plan to do as a class.

## Lorax Challenge

Uses a fun book by Dr. Seuss, The *Lorax,* as a means for students to consider their role in environmental problems through their lifestyle. This is an excellent book because it raises the issue of the environment in a fun but hard hitting way. It also does not provide any easy answers in that the discussion can come back to the role of each of our lifestyles in creating environmental problems.

**What to Do**

Leave a challenge note for students (use page 9 of this handout) which asks them to find a copy of The Lorax. Have them read it and then discuss it in terms of their own actions in relation to the environment. Depending on time and energy, they could make this story into a play or skit to present to other classes.

## Community Involvement

An activity in which students identify areas near their school which have been damaged by erosion, trampling, etc. They then come up with ways to restore the area and implement them.

**What to Do**

1. Leave out the challenge note from the chief (use page 10 of this handout) for the students to discover. asking the students to work to improve their "community", the ecological community around the school.

2. Have the students go outside around the school to look for areas that show signs of soil erosion, compaction, or other damage caused by student/human activities.

3. Have students discuss and list ways that they might control the problem—placing signs, planting the area, making a designated walkway, etc.

4. Have students get permission to try these measures and then take the steps to carry them out.

This whole activity could also be carried farther afield to a local park or area around home.

## Back to the Earth—Biodegradable Items

An activity to increase awareness of biodegradable versus inert items and the consequences of throwing them out as garbage.

**Items Needed**
• 2 organic items (apple core, piece of lettuce, piece of bread, etc.)
• 2 inert items (packaging, styrofoam, plastic, etc.)
• a small shovel
• and large containers with soil in them (if you do this inside)

(this can also be done in small groups if students contribute some items from their lunch leftovers, in addition to those in the boxes)

**What to Do:**

1. Find a spot outside where it is ok to dig a few holes (the alternative is to simply bury the items in soil in the classroom. If you use this approach, the soil should be kept moist).
2. Students dig 4 holes big enough and deep enough for each item in box.
3. Place items in hole, cover, and mark spots so students can dig them up again.
4. Wait 4-6 weeks and go back and dig them up. Observe what you find.

**Observations**

• The organic items will disappear or start to decompose, the others won't.
• Which of these is better for us...and our planet? Are we taking too many things from the earth that can not be put back? Is it important to change our habits? Have students discuss this in light of what they use, what they throw away, and what can be used over and over again by the earth and what can not.
• Discuss how compost piles work and what the compost can be used for. Point out that compost piles recycle organic materials to other living things. Organic materials trapped in landfills as garbage do not have the proper conditions to break down and be recycled to other living creatures. Ask if anyone has a compost pile at home.

(this activity comes from *50 Simple Things Kids Can Do to Save the Earth*—p.140)

## Garbage Test

A simple activity to make students more aware of the garbage they create with their lunches or snacks, and encourage them to reduce it.

**What to Do**
Read the note describing the activity from the Chief (use page 11 of this handout). As students eat at snack or lunch, have them pile the garbage by categories neatly on the table or floor (i.e., plastic, cans, paper, bottles, juice packs, etc.). Count the number of each item and multiply by 200 (approximate number of school days in a year). Look at the garbage again. How can each person bring the same lunch with less waste? How can these materials be reused or recycled instead of going into the garbage. Encourage students to make some changes for next week.

Repeat this exercise a second date and note whether there has been any improvement.

# The Community Improvement Challenge

There are lots of plants, insects, birds and animals living right around your school. Here is a challenge to see if you can investigate how they are doing and figure out ways to improve things for them:

1. Go outside around the school grounds or to a nearby park and use your detective skills.

2. Look for places where it seems that humans have damaged things and hurt homes for plants or animals. Look for grass that has been trampled on, or places where water has washed away the soil. Look for leaves, flowers, or branches that have been hurt.

3. Talk about what things you can do to solve the problems so that conditions are better for the plants or animals. Could you put up a sign to keep people away? Could you build a special walkway? What else?

4. Ask permission to actually do something you have suggested to show your CARE for the plants and animals.

Thanks,

**The Chief**

# The Investigators' Garbage Test

Let's see how much garbage you create at snack or lunch at school. Here is how you investigate:

1. After you are done with your food, keep the garbage you would usually throw away on the desk in front of you.

2. List as a class the types of garbage that are left over.

3. Have everyone pile each type of garbage in separate piles in a central spot on the floor or on a table.

4. Count up the number of items in each category and list the numbers on the board. Then add up the totals in each category to get the total amount of garbage created today.

5. Multiply the total amount of garbage today by the total number of school days to find out how much garbage is created by your class in a year.

6. Discuss how you could reduce the amount of garbage and then repeat this test a week later to see if you have been able to do it.

Good luck!

**The Chief**