WHY DO WE NEED TREES?

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(Note; Time allowed only for the demonstration of the game "Living Tree" from this workshop, at the end of the Paper *Environmental Education Developing Attitudes and Understanding for the Environment).*

The games demonstrated in this workshop attempt to explain the importance of plants. This does not involve discussion about uses of plants but rather, why they are essential to all life on earth. At the end of the session, time is usually spent discussing how we can all adjust our usage of plants for the sake of the health of the planet. The session also leads onto direct personal action, in the form of growing trees.

SETTING THE SCENE

Lay everyone on the grass, with eyes closed. *Hold on tight, because the planet we are on is presently speeding through space at about 110,000 kph. It is also spinning like a top and the whole solar system we are in is turning slowly over and over. Every inch of space we travel through is a new one, we have never been there before. Luckily for us we take along a special supply of energy. The Sun. Sunlight powers all life on earth. But can you eat sunlight? Have a go - open your mouth and see if you can catch enough sunlight to chew. So how does the sun power us? How do we get hold of the sun's energy? Well there is only one group of living things that can turn the sun into energy. The plants. Imagine you are a leaf on a tree. Just under your skin there are small green dots called chloroplasts. They are what makes you green. Those green dots are able to catch the sun, mix it with water and carbon dioxide and hey presto energy! So soak up that sunlight and make energy for you to grow. But how do other living things, such as people, get hold of that energy? We eat it, we eat the plants. So we depend on plants for our food.* Open your eyes.

LUNCH BREAK

Aim; that children understand that they are individually dependent on plants for food.

Is it true? Well, what did you have for lunch/dinner/breakfast? Did any of your food not come from plants? (everything originates from plants because they are at the base of all food-chains).

How does the plant get the water? How does a tree work?

LIVING TREE

Aim; that children understand that a tree is a living organism and how it works.

We are going to construct a tree using you as the parts. Choose the tallest and strongest person in the class. He/she is the HEARTWOOD of the tree. *The Heartwood is the strength of the tree, holding the tree upright but the heartwood of the tree is dead.* (that's why a tree can be hollow and survive, although structurally weakened - only the dead heartwood is missing). *Around the heartwood is the area of the tree where all the action takes place - the sapwood. This is made up of two sections. The first one is the* XYLEM. *The xylem is where the water is drawn up the tree to the leaves to be mixed with sunlight.* Choose three people to be the xylem by joining hands to make a circle around the heartwood. *The second part of the sapwood is called the PHLOEM. The phloem is where the energy made in the leaves (in the form of sugar) flows back down the tree to feed the roots and branches.* (The fact that there is sugar can be seen when a tree is injured and the sap flows. In many trees this actually tastes sweet eg maples, eucalypts). Choose five people to be the phloem by joining hands to make a circle around the xylem. *What is on the outside of a tree?* The BARK. *What does the bark do?* It protects the tree from insects and diseases, a bit like a suit of armour. Choose eight people to be the bark by joining hands to make a circle around the phloem. The rest of the children can be the ROOTS (except for two). They need to lay on the ground with arms spread wide (and long hair fanned out as rootlets) to find the water needed to make the whole thing work.

This is how you make the tree live. The roots say sluuuurp! The xylem says sluuuurp and waves their hands in the air. The phloem gasps loudly (taking in carbon dioxide) and aaah, then sags at the knees. This has to be done in a synchronised way so that the tree sounds like this "sluuuurp, sluuuurp, gasp, aaah!" Practise for a short time to make sure the tree is working. The two remaining children are INSECTS. Their job is to get to the heartwood of the tree within 5 seconds. If they manage it, the tree is dead. If the tree stops pumping then it is dead. (choose sensible children to be insects, otherwise rough play will bring the lot crashing down) *Ready set go 1... 2... 3... 4... 5 Stop.*

Other activities related to this are a) catching evaporated moisture form the tree by placing a plastic bag over some of its leaves. Talk about where the moisture would have ended up if you hadn't captured it. b) Listening to a tree's heartbeat with a stethascope. This is particularly good with smooth-barked trees.

A PATCH OF OXYGEN

Aim; that children understand that they are individually dependent on plants for oxygen. And that there is something they can do to stop the loss of trees.

One of the by products of the tree's life is oxygen. After they have breathed in carbon dioxide and mixed it with sunlight and water, there is a bit of oxygen left over which is breathed out. What is oxygen good for? How many trees do we need to produce enough oxygen for one person? An area of plants of about 625 square metres is required to supply sufficient oxygen for one person. If the trees continue to breathe so does the person. That is a square 25 big steps by 25 big steps (25 m x 25 m). Step it out at a run, so that everyone is puffed out at the end. Stand in the centre. *There is only enough oxygen in this square for one person. So, when I say, everyone has to hold their breath. I will touch one person at a time. When I touch you, you may take two deep breaths but then must stop breathing again.* Continue this until people are obviously no longer able to hold their breath. *OK everybody breathe. So how is it that we can all breathe?*. There are lots of trees in other places. Discuss the importance of areas like the Amazon forests as oxygen suppliers. But every plant helps. Discuss the rates of deforestation around the world. Discuss how we all can adjust the things we do in every day life to reduce the amount of forests cut down. Ask for suggestions. Recycling, using less, planting trees. Follow up the session, at a later date, with another to grow a personal oxygen supply (ie trees).

WEB OF LIFE

Aim; that children understand that all living things depend on plants for their existance. And that they identify with animals on a personal level.

Sit the group in a large circle. Have one person stand in the centre of the circle. That person represent all plants. Ask the group for examples of animals that eat plants. As each example is given, link that child to the plants with the string. Take the string back wards and forwards to the plant... Now choose one of those animals and ask for examples of animals that eat it. Link those animals into the web of life. Keep going using other animals and their predators until all the children are linked into the web. When you are setting up the web,

be sure to include "people" as one of the links in the web. *What would happen if I decided to poison the plants?* Make sure everyone has a good hold of their string and then tell the plant to tug (not too hard) on the string. Everyone who feels that tug should also tug on the string. Keep going until you run out of tugs. Everybody in the web of life should feel a tug on the string - and therefore would be affected in some way by the demise of plants. Choose various animals from the web and ask how they think they would be affected if the plants were killed.

THE SLISHY SLOSHY SWAMP

Aim; that children understand that animals depend on plants as habitats. And even ugly places are important. And to protect animals we need to protect the places where they live and the other species in those places.

Imagine the following place - the Slishy Sloshy Swamp. The Slishy Sloshy Swamp is totaly unique. There is bright orange mud, one metre deep on the floor of the swamp. It is warm and bubbles slowly. There are giant trees that stretch into the sky for over 100 m and create a canopy which blocks out most of the light. So it is dark in the swamp all the time. The animals in the swamp include giant flys, which come into the swamp to lay their eggs in the mud (the size of hens eggs). The warm mud incubates the eggs. There are giant mosquitoes too. And poisonous tree snakes, which luckily spend most of their time in the tree tops, because their venom causes instantaneous death. Ask each child to design and draw an animal that is capable of living in the swamp. It can have any feature you wish to give it as long as there is a reason for it. It needs some way to eat (hollow fangs to suck the eggs perhaps), protection from its enemies (a shell or spines or a horrible smell), a means of moving around on the mud (big flat feet) and a way of finding its way around in the dark (big eyes and ears, whiskers, sonar, luminous nose) and so on. Compare imaginary animals. Compare imaginary adaptations with those of real animals. Write a news article about your amazing animal.

Invent a threat eg Someone is going to pump out the orange mud to sell as undercoat paint. What will happen to the swamp if the mud is pumped out? The trees die - so no more shade for the animals, the mud is gone - so no more eggs for the animal to eat. The animal becomes extinct. So, what can you do to save your animal? In this case the best solution is to save the place, that is create a Slishy Sloshy Swamp National Park.

What about if someone came in and cut half the trees down? The shelter is gone and half of the swamp is of no use to the animals. How do you repair the damage? By growing more

trees from seeds collected from the trees in the swamp (ie A recovery plan working with your local botanic garden). Is there a Slishy Sloshy Swamp near you requiring your help?

(Please note; the Slishy Sloshy Swamp story and activities are taken from a publication "The Amazing Slishy Sloshy Swamp" by Andrew Smith, presently being prepared for publication.)

Bibliography and references for Are We Doing It For the Environment?, Classification By Senses, Why Do We Need Trees?

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REFERENCES

Australian National Biodiversity Draft Strategy Department of Arts, Sports, Environment, Tourism and Territories. 1992.

BRIGGS, J.D. and J.H. LEIGH, 1988. *Rare or Threatened Australian Plants*, Australian National Parks and Wildlife Service.

CORNELL, Joseph B. *Sharing Nature with Children.*

CORSON, Walter H. , 1990. *The Global Ecology Handbook, What You Can Do About the Environmental Crisis*. The Global Tomorrow Coalition, Beacon Press.

MATRE, Steve Van, 1979. *Sunship Earth*, Institute of Earth Education, American Camping Association.

SMITH, Andrew, 1989. *Leaf Walk - Plant adaptations Teachers Kit*, Royal Tasmanian Botanical Gardens.

SMITH, Andrew, 1990. *The Amazing Sun Powered Food Factory Teachers Booklet*, Royal Tasmanian Botanical Gardens.

SMITH, Andrew, 1991. *From Small Seeds... a green world grows*, Royal Tasmanian Botanical Gardens and the Australian Early Childhood Association.

SMITH, Andrew. *The Amazing Slishy Sloshy Swamp*, in press.

YOUNG, M. D.; K. D. COCKS and S. E. HUMPHRIES, 1988. *Australia's Environment and its Natural Resources*, CSIR0 Australia, Institute of Natural Resources and Environment.