



Environmental Studies

EXPERIMENTS

PROJECTS

ACTIVITIES

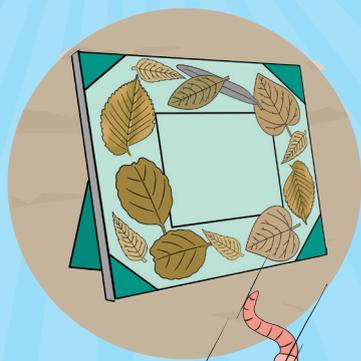
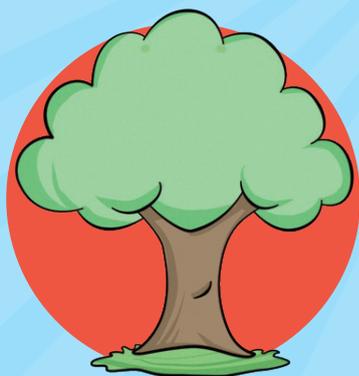
BOOK

1

Vidhu Narayanan



Syamala Srivatsa



From the desk of Dr R K Pachauri

The world's urban population is projected to increase from 3.6 billion to 6.3 billion between 2011 and 2050. It is also projected that by 2020, half of Asia's population will be living in urban settings. While urbanization suggests economic opportunity and growth; its flip side implies detachment from nature.

Young children live in a sort of wonderland. They look at objects with a sense of awe and wonder, inspect them, and then embrace or discard them. They may like to collect leaves, pebbles, wild figs, etc. This quest or exploration is a potential tool for teachers to engage the young minds with nature. And research suggests that environmental education not only involves students in learning, but in raising their test scores and encouraging them to pursue careers in environmental and natural resources.

Students are equipped for tomorrow's challenges in schools. They are taught complex environmental issues here and are trained to be good stewards of the environment. The need of the hour is to not only raise talented and intelligent individuals at schools and other institutions, but to develop an environmentally-literate generation of problem solvers. It will help ensure that tomorrow's decision-makers are prepared for the challenges they might face.

The series titled *Environmental Studies* has been developed with such a vision. It is a rich resource for children to understand their natural environment through projects, experiments, games, audits, surveys, and activities based on understanding the essence underlying air, water, soil, and energy conservation. The contents of the books of this series aim to encourage children to "study nature".

Since children are going to become leaders of the future, it becomes our primary responsibility to equip them for tomorrow's challenges. A major part of this involves commitment from us to provide them with environmental education that helps them become the educated thought leaders of tomorrow.



R K Pachauri

Director General, TERI



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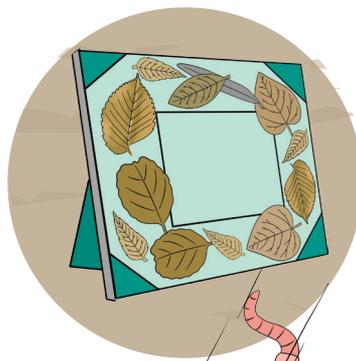
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The Energy and Resources Institute



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CONTENTS

Craft from Trash	4
Web of Life	6
Cloud Magic	10
The Vanishing Jumpit	13
Measure the Rain	16
Herb Mobile	18
Every Drop Counts	20
The Weird World of Worms	24
Track Art	26
Waste Audit	28
Do You Care About the Earth?	31
Leaf Collage	34
What's Out There?	36
Making Smog	40
Bonding with Birds	42
Tick Mark the Correct Answer	45
Glossary	48

CRAFT FROM TRASH

To recycle or upcycle discarded products to reduce waste



FOCUS AREA
3Rs and waste management

LOCATION
Classroom or home

GROUP SIZE
A child

DURATION
35–40 minutes



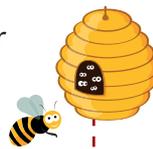
SKILLS

Organization, resourcefulness, fine motor skills, eye-hand coordination, understanding instructions

Most of the times we buy new things, because our friends have them. We seldom think about reusing what we already have. We do not think how many natural resources are used to make it or what happens to the waste generated. And we are not bothered about how it pollutes our environment. Well, our grandparents practised reuse and were smarter than us. They turned old things into new products. Let us wear our creative caps to recycle some of the old and discarded things around us.

YOU WILL NEED

- 4 CDs and frames
- Oil paint
- 2 strings (20 in long)
- 10 beads and bells
- Sellotape
- Thick white paper
- 4 in satin ribbon
- Glue
- A family photograph



GET SET GO

SUNSHINE SPARKLER

1. Take 2 old CD-ROMs and paint their plain, silver side.
2. Place them together, with their painted side out. Loop a 20-inch-long string through the centre of the CDs. Tie a knot at the edge to bind the CDs and string a bead.



Steps 1–2



Step 3



Step 4

BE CAREFUL

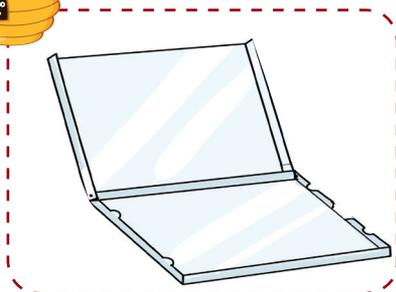
Ask your parents before you choose to work with any CD. It may have some important information.



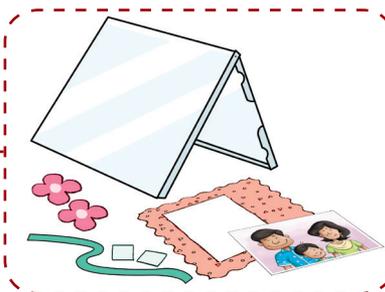
- After a 4-inch gap, tie a knot and string a bead. Repeat till you reach the end of the string. Create a loop at the end of the string by tying a knot at the end.
- Your sunshine sparkler is ready. Hang it in a window and watch it shine.

PHOTO-STAND

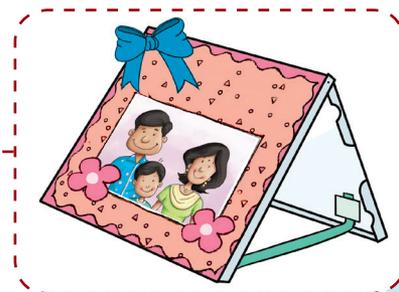
- Remove the printed label from the the CD case. Now cut the white paper in the same size as the printed label.
- Paste the photo on the white paper.
- Gently insert the sheet inside the front cover of the CD case.
- Make a bow with the satin ribbon and paste it near the top left corner on the front cover of the case. Decorate it with colours and paints.
- Adorn your study table with the photo-stand! You may also paste a photograph of you and your friends, and gift it to them!



Step 1



Step 2



Steps 3-5



WIND CHIME

Follow steps 1 and 2 as you did while making the sunshine sparkler. Tie a knot, string a bell and a bead, and knot again. Repeat this step until you reach the end of the string, where you need to make a loop. Tie the sparklers, and your wind chime is ready!



HELPFUL HINTS

Use sellotape to attach a 4-inch-long satin ribbon, as shown in the last illustration below, to let the frame stand even if widened too far.

NOTE TO THE TEACHERS

Show the finished products to the students before giving them instructions. Also ask the students to create more products from other waste items at home. Organize a sale of these products and give the money for charity.

EXPLORE FURTHER

Find out why is it difficult to recycle CDs and what happens to discarded CDs.

WEB OF LIFE

To understand how food chains work in nature



FOCUS AREA

Food chains

LOCATION

Classroom

GROUP SIZE

4–5 children

DURATION

30 minutes



SKILLS

Spontaneity, diverse thinking, problem solving, teamwork, concept formation, classification, sensitivity for the natural environment

Do you know that you become a source of food for a lizard or a frog, every time a mosquito bites you? Sounds strange, isn't it? However, it is true. This happens when the mosquito becomes the prey of a lizard or a frog after biting you.

Similarly, all the living things depend directly or indirectly on the green plants. How? Plants absorb energy from the Sun to make their own food by photosynthesis. Hence they are also called producers. This food is used by all the other living things on Earth, they become consumers. These consumers can be herbivores*, carnivores*, or omnivores*. For example, plants are eaten by goats and goats are in turn food for a tiger.

Now you must be wondering how all this happens! Well, a food chain can describe how the different organisms depend on each other for food. Let's play this card game to understand how it all happens in nature!

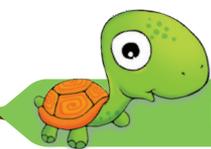
YOU WILL NEED

- White chart papers, sized 22x28 in, to form 48 cards per group
- Sketch pens
- Scissors
- A list of producers and consumers

*The meaning of these terms are given on p.9

GET SET GO

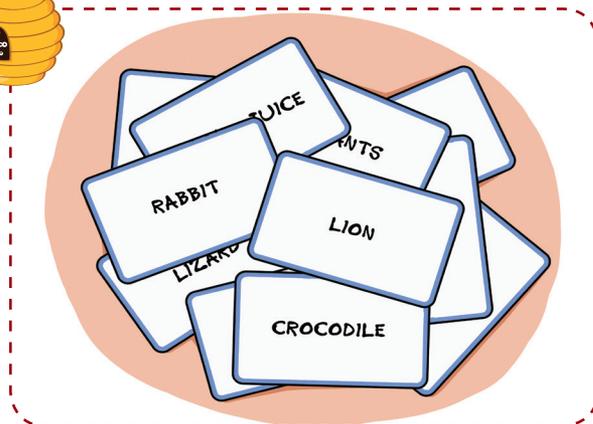
1. The teacher divides the class into groups, with 4–5 members in each group, and also selects leaders for these groups.
2. Now each group leader makes 48 blank cards from a white sheet. Then the group leader writes the name of a plant or plant product on 16 of these cards to show the producer* category, herbivores* on another 16 cards, and carnivores* or omnivores* on the remaining 16 cards (refer to the list of organisms given on p.8).



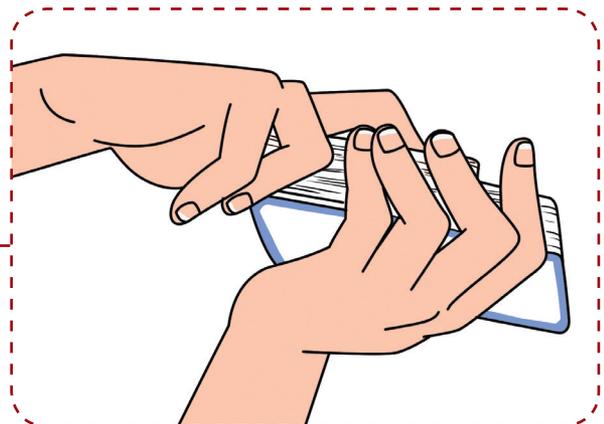
- The group leaders shuffle the three sets of cards and jumble them up. Remember each card carries the name of a plant or animal.
- The group leaders spread the cards in the middle. Each member of the team picks up a card. As soon as the teacher says "Get, set, go" each member rushes around to find their right place in the food chain. The group that forms the chain the fastest is the winner. The sequence of the cards must be a plant or plant producer, a herbivore, and the last card a carnivore or an omnivore to complete the food chain.
- Similarly, the group members make the next food chain and so on.
- The group or team that makes use of all its cards to make food chains in the shortest span of time is declared the winner.

BE CAREFUL

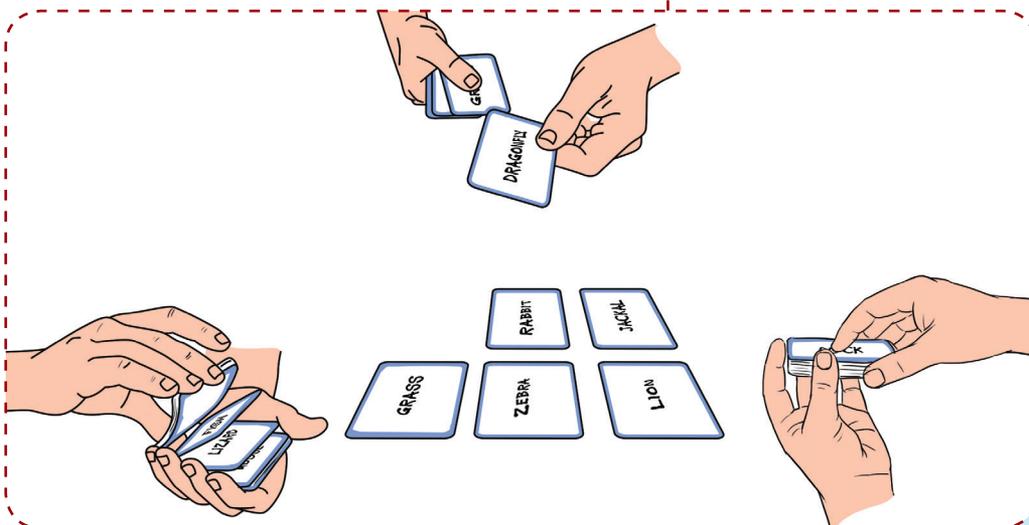
- Every food chain starts with a plant or plant product.
- Never begin any food chain with the Sun.



Steps 1-2



Step 3



Steps 4-6



PLANT/PLANT PRODUCT**HERBIVORE****CARNIVORE/OMNIVORE**

GRASS → DEER → TIGER

NECTAR → BEE → LIZARD

GRAINS → MOUSE → SNAKE

LEAVES → CATERPILLAR → BIRD

PLANTS → FISH → KINGFISHER

CARROTS → RABBIT → JACKAL

PLANT JUICE → DRAGONFLY → FROG

WEEDS IN WATER → DUCK → CROCODILE

GRASS → ZEBRA → LION

Fill up the following boxes with relevant organisms to make 6 more food chains.

PLANT/PLANT PRODUCT**HERBIVORE****CARNIVORE/OMNIVORE**

→	→	→
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→	→	→
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Environmental Studies : Experiments, Projects, Activities : Book 1



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