Brink

A Call to Adventure ©

Curriculum

Module 8

Disappearing Forests

Resources

Middle Years of Schooling (Years 7 – 9)

Developed by: Hilary Macleod

Queensland Government
Education Queensland

Independent Schools
Queensland

Earth Charter
Australia

Brisbane Catholic
Education

Queensland Catholic
Education Commission

Resources

Introduction to Brink Adventures

- Introductory Resource sheet: A website guide
- Introductory Resource sheet: Journal reflections
- Introductory Resource sheet: A map of the route
- Introductory Resource sheet: What do we know about the Rainforest from Brink Adventures' expedition?

Disappearing Forests

- Resource 1: Environmental Cartoons
- Resource 2: News Reports
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- Resource 4: Human Use of Rainforest Products
- Resource 5: KWL Chart
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- Resource 7: How Have Patterns of Deforestation Changed Over Time?
- Resource 8: Who Buys Tropical Rainforest Timber?
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- Resource 13: Rainforest Futures Wheel
- Resource 14: Values statements

Resource sheet: A website guide

Go to www.brinkadventures.org . Scan the home page, known as Base Camp, and answer the following questions:

1. What does the word brink mean?

_____

2. Click on Gallery to view photos from along the expedition route. Describe one of the photos that you like.

_____

_____

_____

3. Click on Back and then click on the red and white cross in the top right hand corner of the page to close these pages and return to Base Camp.

4. Locate and click on Fact Files on the left hand side of the page. Locate the Topic box and select National Parks. On the Country box and select any country. Go to Sort and select latest date.

a) What is the name of the national park in Chile that was visited by Brink Adventures?

_____

b) Click on the link. List six animals that are found in the national park.

_____

_____

_____

_____

Resource sheet: Journal reflections

Directions
Part A

- Go to **www.brinkadventures.org** .
- Locate and click on Journals on the left hand side of the home page.
- Locate the Topic box and select School Journals.
- Locate the Country box and select any country then click on Go.
- Click on San Flaviano Schoolroom and answer the following questions:

1. Read what has been written about this community and choose two things that you think are interesting and list them here.

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2. How can people in Australia help children living in the San Flaviano community?

Directions
Part B

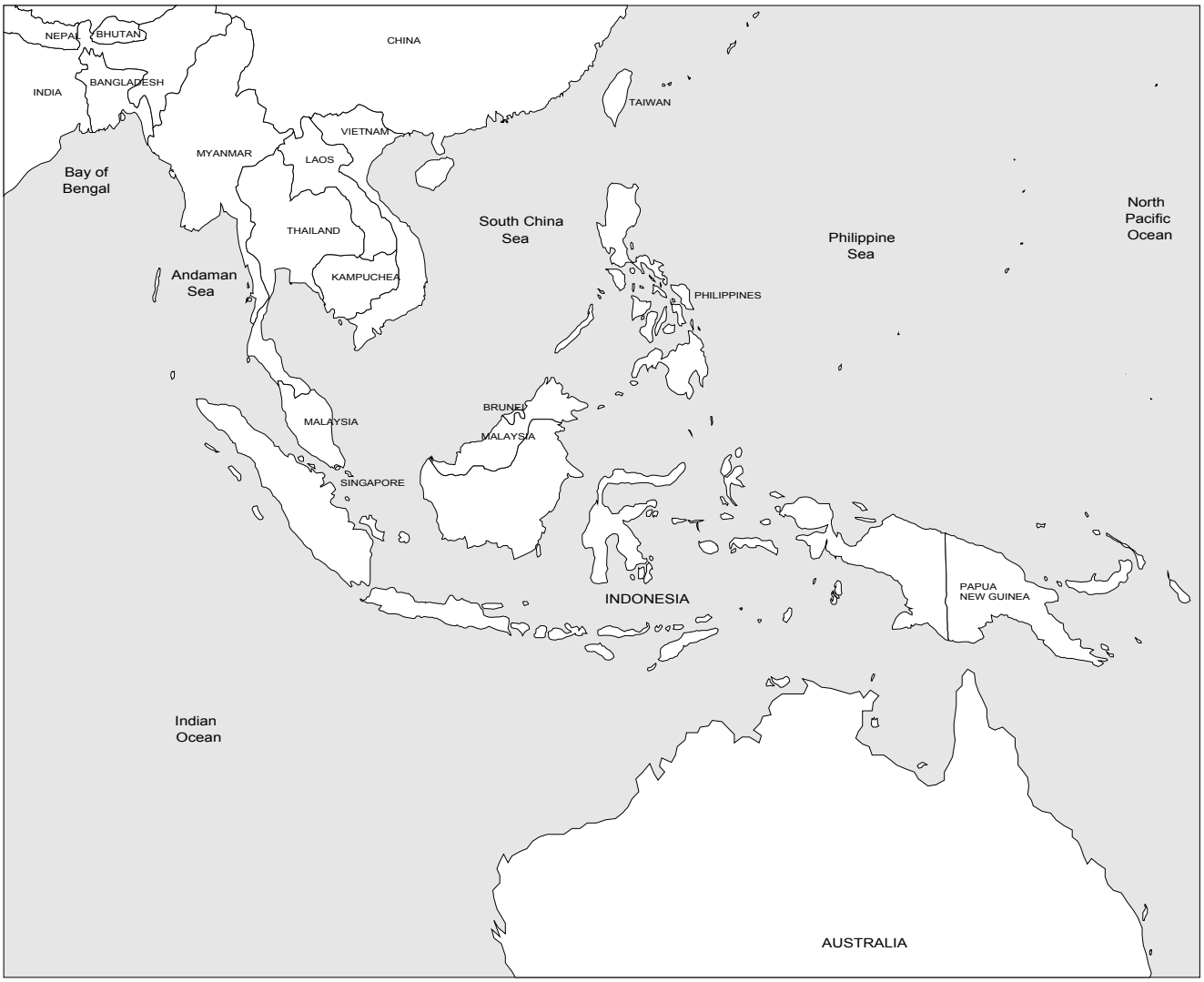
- Go to **www.brinkadventures.org** .
- Locate and click on Journals on the left hand side of the home page.
- Locate the Topic box and select Interviews.
- Locate the Country box and select Australia then click on Find.

1. How did Brink Adventures begin?

- Go back to the topic box and select any topic. In the Country box select Spain.
- Locate the item entitled ‘Hitting the frog and toad’.

2. Read and summarise Kendon’s impressions of the dock area in Gibraltar where he stayed.

Resource sheet: A map of the route



Resource sheet:
What do we know about the Rainforest from Brink Adventures'expedition?

Directions
Part A

- Go to **www.brinkadventures.org** .
- Locate and click on Journals on the left hand side of the home page.
- Locate the Search Title box and type in' jungle'.
- Locate the Topic box and select 'any topic'
- Locate the Country box and select 'any country' then click on Go.

1. Which of the countries already visited by the expedition contains rainforest or jungle?

   _____

2. Read the journal entries and make a list of the animals that live in the rainforest (jungle) and the dangers you might encounter

Rainforest animals	Potential dangers

3. Describe weather conditions in the rainforest.

   _____

   _____

Directions
Part B

- Go to **www.brinkadventures.org** .
- Locate and click on Fact Files on he left hand side of the home page.
- Locate the Topic box and select Indigenous peoples.
- Locate the Country box and select Brazil then click on Find.

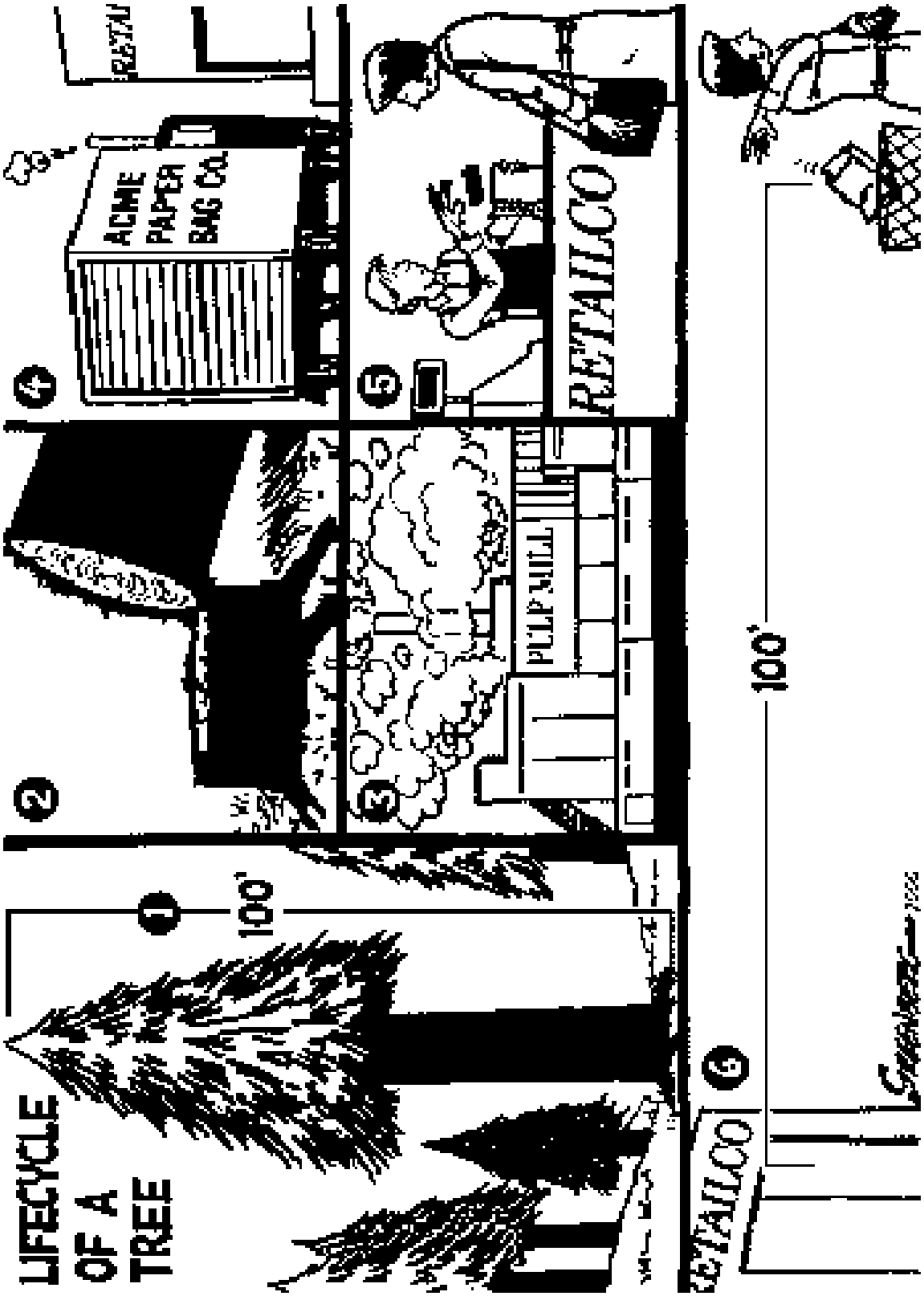
1. What is the name of the group of indigenous people who live in the Amazon rainforest?

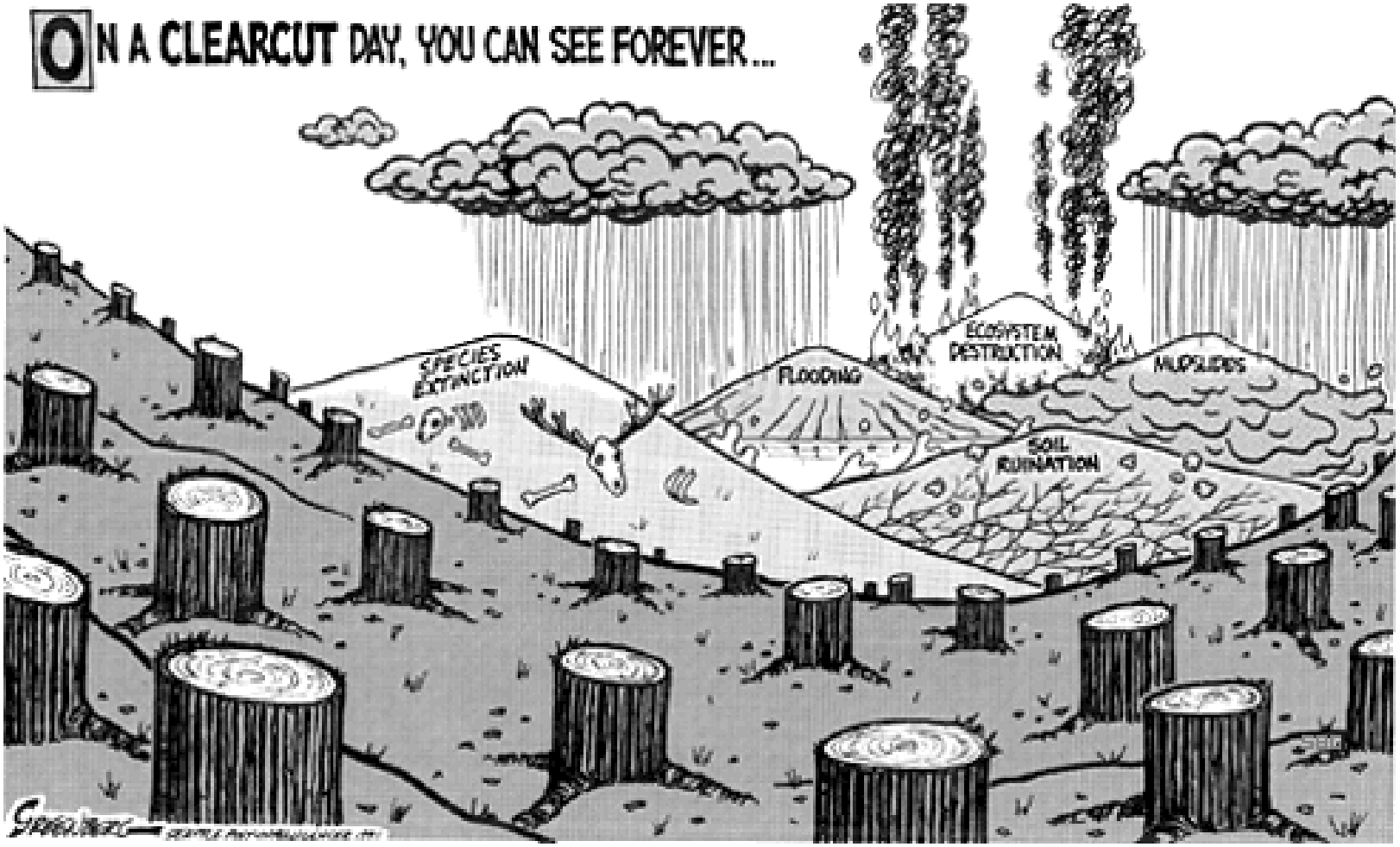
   _____

2. Read through the Yanomami Glossary: add any animals and potential dangers to the list.

Rainforest animals	Potential dangers

Resource 1: Environmental Cartoons




ON A CLEARCUT DAY, YOU CAN SEE FOREVER...
SPECIES EXTINCTION
FLOODING
ECOSYSTEM DESTRUCTION
MUDSLIDES
SOIL RUINATION

Resource 2: News Reports

AM - Smog envelopes Kuala Lumpur

[This is the print version of story http://www.abc.net.au/am/content/2005/s1436879.htm]

AM - Saturday, 13 August, 2005 08:10:03

Reporter: Peter Lloyd

ELIZABETH JACKSON: The Malaysian Prime Minister has urged Malaysians to pray for rain to lift the hazardous smog that has enveloped the capital and the surrounding areas.

The smog is drifting across to Malaysia from land clearance fires on the Indonesian island of Sumatra.

The haze, which blanketed Malaysia on Thursday, caused the Government to declare a state of emergency.

Many people are continuing to wear face masks, some schools remain closed and the number of people reporting to hospitals with respiratory, throat and eye complaints continues to rise.

Our South East Asia Correspondent Peter Lloyd reports.

PETER LLOYD: This is the worst air pollution crisis in South East Asia in eight years. The state of emergency declared by Malaysia covers the Klang Valley in which the capital Kuala Lumpur sits.

People have been warned to stop all outdoor activity, wear a mask when outside and drink more water. Schools in the affected area have closed until at least Monday. KL's international airport remains open but visibility has fallen sharply. Malaysian state television has been issuing instructions.

MALAYSIAN STATE TELEVISION: The police and armed forces have been told to be on standby and take the necessary measures to ensure the safety and security of the nation. Government departments, officers, factories, farms and schools in Port Klang and Kuala Selangor have been ordered to close.

Clinics and outlets selling food and basic items, however, are to remain open. The public are advised to stay indoors and stay tuned to their televisions and radios for the latest updates on the proper procedures to be taken during the emergency.

PETER LLOYD: For Malaysia's Government this is a test of transparency. For the past eight years it has refused to publish air quality index numbers for fear of hurting tourism. But for the duration of this crisis, it has caved to pressure and promised regular updates via state-controlled media.

But there are questions about the reliability of official index figures, which are collected only twice a day. By comparison, Singapore checks air quality on the hour.

The haze is caused by fires on the neighbouring Indonesian island of Sumatra. During the annual dry season, farmers clear land through fire rather than the more costly method of employing labourers to do the job.

It's worse this year because new concessions have been granted and farmers are in a hurry to get cultivating.

Fitrian Ardiansyah is from the World Wildlife Fund in Jakarta.

FITRIAN ARDIANSYAH: Usually the dry seasons started in April or May or June, but it's started late in August now, and we got a report from, Sumatra, Riau and Jambi as well as in West Kalimantan, and central Kalimantan in terms of the hot spot and possible fires in some areas in Indonesia.

PETER LLOYD: What can be done to contain the situation?

FITRIAN ARDIANSYAH: I guess one of the things in the short-term should be direct fire fighting on the ground of course, but some difficulties remain in the area because some areas are quite difficult in terms of accessing, in terms of the fire fighting.

So probably other means of equipment need to be given to the Government or to be supported.

PETER LLOYD: The Malaysians have offered fire fighting help to extinguish the blazes, and offered to carry out cloud seeding to induce rainfall. Whether this crisis impacts on the economy depends on how long it lasts and on that score there is some dispute. The Indonesians say it the haze will last until October, the Malaysians say it won't last that long. Residents of Kuala Lumpur will be hoping their side is right.

In Bangkok, this is Peter Lloyd reporting for *Saturday AM*.

Indonesia claims Sumatra fires extinguished

New Sabah Times, Monday August 22 2005

JAKARTA: Indonesia on Sunday said firefighters had extinguished all the fires on Sumatra island blamed for causing a choking haze which smothered the region.

The fires from land clearance in Riau province and neighbouring North Sumatra produced the haze which blew across to neighhbouring Malaysia and Singapore.

"All areas which had been set ablaze in land clearing practices to prepare for plantation, all these can now be said to have been extinguished. So the number of fire spots is now at zero," Forestry Minister Malem Sambat Kaban said on ElShinta private radio.

He said there may still be hotspots, areas of high temperature registered by satellite imaging, but they did not indicate surface fires.

"The problem now is that Riau is an area of peat," he said, adding that while the surface fires had been extinguished the peat could continue burning underground.

"And the more water you pour over it, the more smoke you get," in burning peat areas, Kaban said.

He said the local authorities, with the help of the military, police and several foreign teams, "are now very aggressive in extinguishing" the fires.

The radio said Riau province had in the past days formed a team of some 1,200 people to combat blazes there. They were further assisted by teams from several other countries, including Malaysia.

Kaban also said the blazes were caused by small farmers and plantations clearing non-forest land for planting, rather than forest fires.

"Do not forget that these fires are not in forests. Our forests are not on fire. These are land clearing of plantation areas," he said.

While the government banned the practice of using fire to clear land for farming or plantations, "the environmental awareness and commitment of the entrepreneurs are still low," he said.

Haze from smoke of the fires on Sumatra and the Indonesian part of Borneo island has enveloped Malaysia and Thailand this month, causing health and traffic hazards. – AFP

Resource 3: Personal Actions Checklist

Read the following statements and tick the box if it applies to you or anyone in your family.

- ☐ Use wooden pencils
- ☐ Own wooden furniture or picture frames
- ☐ Own a Mitsubishi car
- ☐ Use the wooden chopsticks that are provided with take away food
- ☐ Have an account with Citibank
- ☐ Wear gold jewellery
- ☐ Use disposable paper products e.g. plates, napkins, bags, notepaper
- ☐ Eat bananas
- ☐ Drink coffee
- ☐ Eat chocolate
- ☐ Eat fast food burgers
- ☐ Buy drinks in aluminium cans
- ☐ Use rubber gloves for washing up
- ☐ Use aspirin for headache relief

Resource 4: Human Use of Rainforest Products

Wooden pencils Unless marked otherwise the chances are the wooden pencil you are using is made from the wood of the *jelutong* tree which grows in tropical rainforests in Malaysia and Indonesia. These forests are increasingly being clear-felled to provide for the demand for wood products. One way to tell *jelutong* from *incense cedar* is that the pencil made from jelutong has no smell, the wood is lighter in colour and it has no grain.	**Wooden furniture or picture frames** Some furniture and picture frames are made from *mahogany*, *meranti*, *teak* and other tropical hardwoods from South East Asian rainforests. Increasing demand for these products can lead to legal and illegal over logging of tropical forests. Other products from tropical hardwoods include musical instruments panelling, flooring and garden tool handles.
Mitsubishi car According to the Rainforest Action Network: 'Mitsubishi Corporation is one of the largest corporate destroyers of the world's forests. Mitsubishi has enormous logging operations reaching from Malaysia and the Amazon to Siberia, Canada, and the United States. Millions of acres of tropical, temperate, and boreal forests are destroyed every year by or for members of the Mitsubishi corporate family.'	**Wooden chopsticks** According to the United Nations Environment Program, Japan is the number one importer and consumer of tropical rainforest wood in the world accounting for 50% of the world trade. Although most of it is used in the building industry the second largest use is for disposable chopsticks called *Waribashi*. The industry uses about 400 thousand cubic meters of timber a year for Japanese consumers to use 130,000,000 waribashi everyday or 11,000,000,000 pairs a year.
Citibank account Citibank is one of the largest banks in the world. It lends money to a company that has developed large oil plan plantations in Indonesia. These plantations have replaced large areas of rainforest that were the home to endangered orang-utans. Oil palm is an ingredient in many products that you can buy in Australian supermarkets e.g.	**Gold jewellery** Not only have large areas of the world's rainforest been cleared to mine for gold but remaining rainforest and river ecosystems have been destroyed by the chemicals such as mercury and cyanide which are used in the extraction process. An estimated 70 – 80% of gold mined is made into gold jewellery.

Disposable paper products Every day more areas of natural forests are converted to plantations for the production of paper. The paper is used in disposable products such as paper plates, napkins, toilet paper, and office paper.	**Bananas** Most of the bananas that you eat are produced in Australia. However it is a fruit that grows naturally in rainforest areas and in some cases large areas of the world's rainforests are being cleared to develop new banana plantations.
Coffee Rainforests in Central and south America have been cleared for coffee plantations. The production also requires large amounts of chemical fertilizers and pesticides.	**Chocolate** Much of Central West Africa's rainforests have been converted to cocoa plantations. Cocoa is the main ingredient in chocolate.
Fast food burgers In 1987 many American customers boycotted Burger King because the beef used in the burgers came from cows kept on cleared rainforest land in South America. Burger King decided to stop using rainforest beef after the boycott lost the company profits. However large areas of rainforest worldwide are still being cleared for cattle and beef production.	**Aluminium cans** The production of aluminium requires large amounts of energy to extract and produce. In Central and South America large areas of rainforest are being cleared to mine aluminium and rivers running through rainforest areas are being dammed to produce the hydro-electric power necessary for aluminium processing.
Rubber gloves About 50 years ago 60% of Thailand was covered with rainforest. Now most has been replaced with rubber tree plantations. The rubber tree provides raw latex which is made into a variety of rubber products including rubber gloves.	**Aspirin** Many of the world's medicines are produced from plants which grow in the rainforests. For example *quinine*, which is used to treat malaria, is extracted from the *cinchona* tree found naturally in South American and African rainforests. Aspirin is a human made medicine but it comes from the 'blueprint' of extracts from rainforest willow trees. Researchers believe that rainforest plants may provide cures for serious diseases such as AIDS, Parkinson's disease, multiple sclerosis, leukaemia, Hodgkin's disease and a large range of cancers.

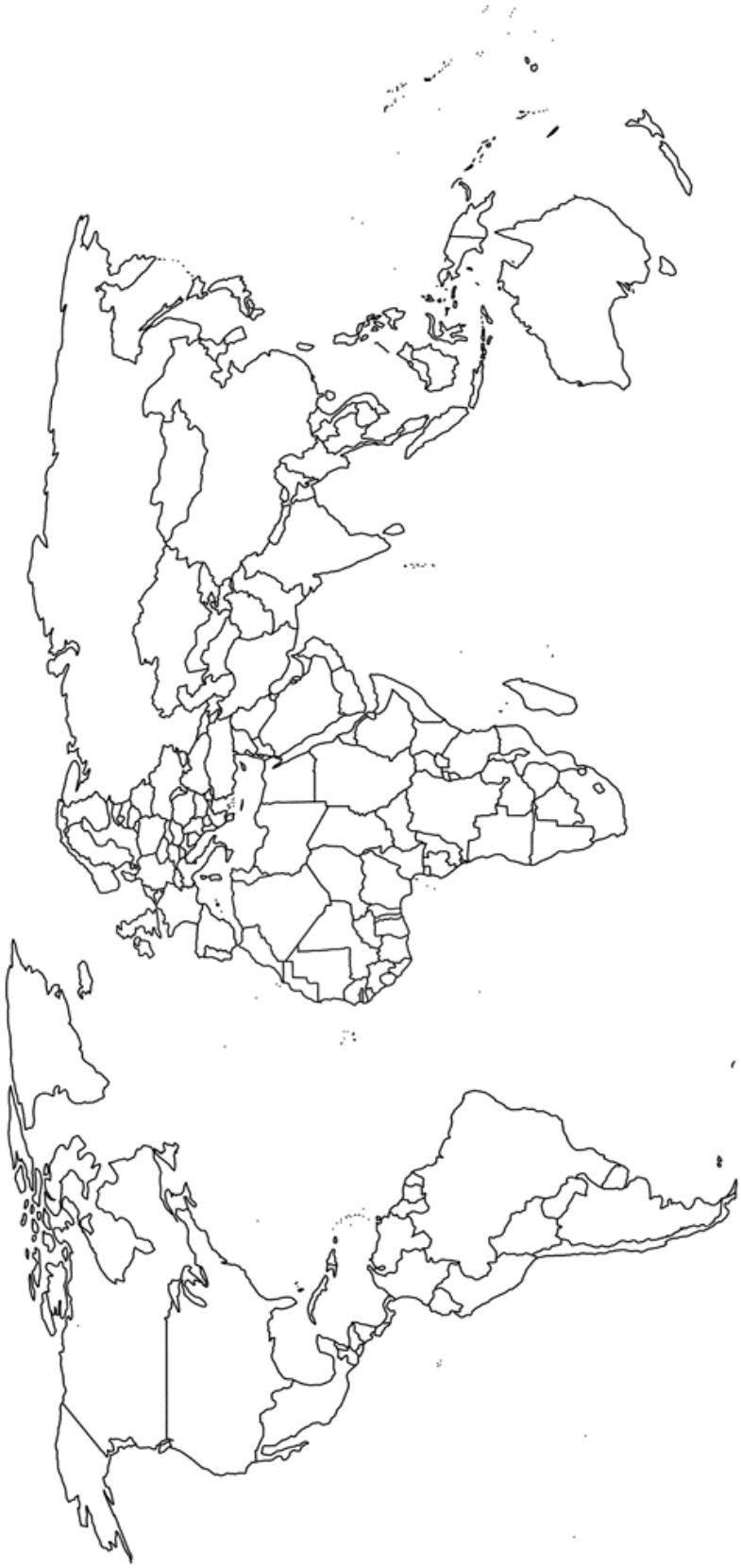
Sources of Information:

Rainforest Action Network http://www.ran.org/
Rainforest Relief http://www.rainforestrelief.org/
Save our Earth http://www.saveourearth.co.uk/soe_rainf.htm
AJET Eco sig http://www.geocities.com/green_in_japan/issues/waribashi.html
Rainforestweb.org http://www.rainforestweb.org/Rainforest_Destruction/Mining/

Resource 5: KWL Chart

what do I **K**now?	what do I **W**ant to find out?	what have I **L**earned?

Resource 6: World Map



Resource 7: How Have Patterns of Deforestation Changed Over Time?

The World Resources Institute estimates that 8,000 years ago 47.7% of the world's land surface was covered with forests. A recent report indicates that nearly half of these forests have been lost and that in the last decade, 2% of total forest area and 4% of natural forest area has disappeared. South East Asia is one of the areas where deforestation is of most concern. At one point countries such as Thailand, Vietnam, Malaysia, Lao PDR, Indonesia and Cambodia could claim to have almost 100% forest cover.

Deforestation Table 1

Country	Original Forest area as a percent of total land area %	Current forest area as a percent of original forest area (1996) %
Cambodia	100	65.1
Indonesia	100	64.6
Lao PDR	99.9	30
Malaysia	99.5	63.8
Philippines	95.3	6
Thailand	100	22.2
Vietnam	99.7	17.2
World	**47.7**	**53.4**

In the table above original forest as a percent of land area refers to the estimate of the percent of land that would have been covered by closed forest about 8,000 years ago assuming current climatic conditions and before large-scale disturbance by humans began.

1. Use this data to estimate what percentage of the land area is now covered by closed forest in each of these countries and the world.
2. Rank the countries in order of those that have been most affected by deforestation to those that have been least affected.

Deforestation Table 2

Country	Total Forest Area (1000 ha)	
	1990	2000
Cambodia	9,896	9,335
Indonesia	118,110	104,986
Lao PDR	13,088	12,561
Malaysia	21,661	19,292
Philippines	6,676	5,789
Thailand	15,886	14,762
Vietnam	9,303	9,819
World	**3,963,429**	**3,869,455**

1. Use the data in Table 2 to work out the percentage change in Total Forest Area over the last decade in the world and in each of these South East Asian countries.
2. Draw an appropriate graph to show your results.
3. How might the result for Vietnam be explained?
4. Which country has the highest rate of deforestation and which has the lowest?
5. What is the average rate of deforestation in South East Asia over the last decade?

Source of data: World Resources Institute http://forests.wri.org

Resource 8: Who Buys Tropical Rainforest Timber?

One of the major causes of rainforests in South East Asia is to provide timber and timber products to the world market. Who are the major consumers of tropical rainforest timber and what is it used for? The following tables provide some raw data to show the major players in the world trade.

Table 1: Trade in Forest Products

Country	Imports 2000 - 2002 (1000 $US)
Australia	1,470,221
Canada	4,039,071
China	14,805,887
Germany	11,722,848
Italy	7,015,680
Japan	11,718,558
Netherlands	4,337,028
Spain	4,107,392
United Kingdom	8,905,014
United States of America	24,426,362
World	**144,989,290**

1. Convert the raw figures for imports into percentages of the world market.
2. Chose one of the major importing countries and using web or other resources find out how much of the imported timber is from South East Asia and what it is used for.

Table 2: Global consumption of forest products

Country	Industrial roundwood %	Sawnwood %	Wood-based panel %	Pulp for paper %	Paper and paperboard %
Brazil	6	5	-	-	-
Canada	12	5	-	8	-
China	8	5	21	13	13
Finland	-	-	-	5	-
Germany	-	-	5	-	6
Japan	-	6	5	7	10
Korea	-	-	3	-	-
Russian Federation	5	-	-	-	-
UK	-	-	-	-	4
USA	25	30	26	29	27

1. Develop a poster present the above information in a more interesting visual way. You will need to choose appropriate graphs, titles and legends. You may also include other illustrations.

Sources:
World Resources Institute http://forests.wri.org
United Nations Food and Agriculture Organisation http://www.fao.org/forestry/index.jsp

Resource 9: TELSTAR Model of investigation

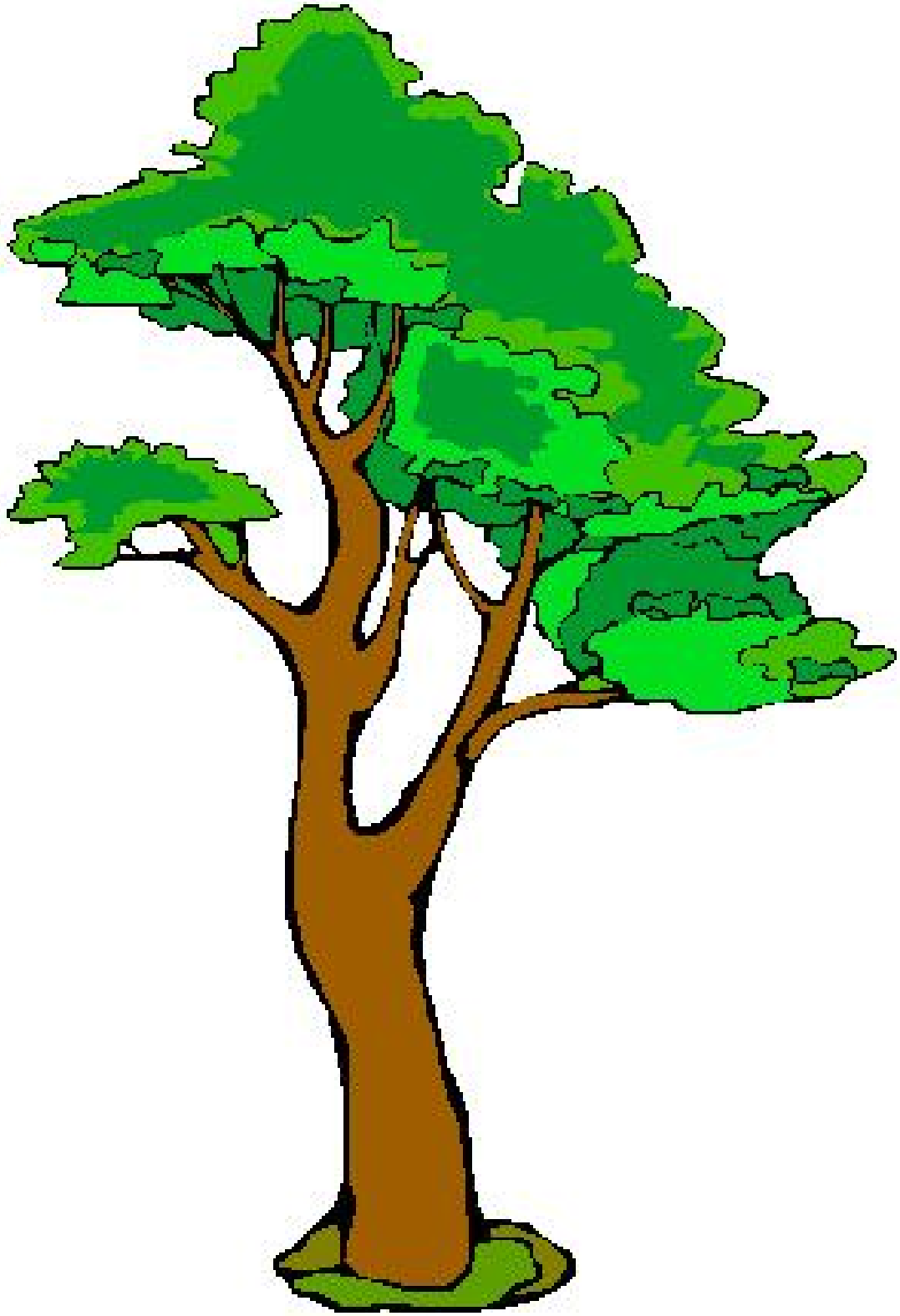
TELSTAR Step	Focus Questions
Tune In 	**What do we want to find out?**
Explore 	**What do we already know?**
Look 	**How will we collect and record the information?**
Sort 	**How will sort our results into useful chunks?**
Test 	**What conclusions can we draw from our information?**
Act 	**How will we present our information?**
Reflect 	**Have we answered the question?**

Resource 10: Values of a Rainforest

Indigenous use **Indigenous groups live in the three major rainforest regions of the world – Amazonia, Africa and South East Asia. They are mainly hunter-gatherers who depend on and live in harmony with the rainforest. For example the Penan of Borneo are nomadic people for whom the rainforest is a source of shelter, medicines and food. The survival and way of life of the Penan people continues to be threatened by both legal and illegal logging.**	**Biodiversity** **Rainforests are one of the most 'biodiverse' areas on earth. Biodiversity refers to the number and variety of species of animals and plants living in the area. It is estimated that about half of the world's plant species live in rainforest areas. Biodiversity is important because**
Ecosystem regulation **Rainforest trees hold the soil together and prevent soil erosion. In many cases, although the rainforest soil is rich and productive, it can harden into a rock or concrete like substance if it is exposed to sun and the air. The trees also help filter and purify the rainwater that falls and act as a storage sponge to prevent flooding.**	**Animal habitat** **A large number of endangered species survive in the rainforest for example the orang-utan whose name in Malay means 'person of the forest lives only on the islands of Borneo and Sumatra. However their survival is threatened by logging. Other endangered species in other parts of the world include the jaguar, Brazilian tapir and Australian tree kangaroos.**
Climatic regulation **Rainforest regions around the world act like giant storage areas or 'sinks' for Carbon dioxide. If these areas are cleared or burnt it releases carbon dioxide into the atmosphere where it contributes to the greenhouse effect and global warming. High rates of evaporation and rainfall mean that rainforests are also play an important role in regulating global rainfall and temperature patterns.**	**Non-wood forest product** **Many other commercial products such as rattans, bamboos, incense oils, nuts, dyes, gums and resin come from the rainforest. For example the giant Malaysian Honey bee likes to make its nest in the crown of the *Mengaris* tree. The *Mengaris* is one of the tallest trees in the world and you can often see climbing steps carved into the trunk to allow people to collect the honey.**

Medicine **It is estimated that approximately 40 % of all the medicines sold in a chemist shop originate in rainforests. They can be extracted from the roots, bark, stems, leaves, fruit and flowers of medicinal plants or can be manufactured in laboratories based on the 'blueprints' of chemicals found in the plants.**	**Ecotourism** **Nature based tourism is one of the fastest growing industries. In Borneo people travel to areas such as the Kinabatangan river to experience jungle trekking and the opportunity to see endangered animals such as the orang-utan, Sumatran rhino, Asian elephant and birds such as the Rhinoceros Hornbill.**
Wood products **Timber is the value most people associate with the rainforest. Valuable hardwoods such as mahogany, red cedar and teak are extracted and made into furniture or for building supplies. However most of the less valuable wood is used locally for fuel.**	**Food crops** **Rainforest biodiversity is also important because it provides the genetic material for many of our important food crops. Many commercial species such as bananas, coffee and rubber originate in the rainforest.**

Resource 11: Tree template



Resource 12: Monetary and Non-monetary Values

	Rainforest Tree	Monetary value assigned[1]	Non-monetary value assigned[2]
1	Mahogany *Pterocarpus indicus*	AUD 2100 /cu m	Tannin or dyestuff: The wood gives a reddish dye. It is also a source of kino (dark resin). Medicine: The red latex is used in folk remedies for tumours, the plant for cancers, especially of the mouth. The leaves are reported to significantly inhibit the growth of carcinoma cells in mice. Malaysians apply the kino to sores of the mouth. Javanese apply the young leaves to boils, prickly heat and ulcers. In the Carolyn Islands, finely powdered leaves are applied to a ruptured vagina. The kino, containing kinotannic acid, was once administered in diarrhoea, often combined with opium. Reported to be antibilious and emetic, Malay padauk is a folk remedy for bladder ailments, diarrhoea, dropsy, headache, sores, stones, thrush, and tumours of the abdomen. Other products: The leaf infusion is used as a shampoo. Nitrogen fixing: Studies in Hawaii, Malaysia, the Philippines, and Singapore, indicate that this tree fixes nitrogen in the soil.
2	Red cedar *Toona ciliata*	AUD 5000 / cu m	Dyes: The flowers make a yellow dye (gulnari). Medicine: The bark is used as an astringent. It gives resinous gum, which is used as a febrifuge (drug to reduce fever). Apiculture: Important bee production plant in Bangladesh. Aesthetic: It is also an ornamental tree and provides shade.
3	Teak *Tectona grandis*	AUD 3350 /cu m	Tannin or dyestuff: Both the root-bark and the young leaves produce a yellowish-brown or

[1] Timber prices fluctuate greatly. These prices have been averaged from a number of internet sources and represent an indication of the timber price on the international market.

[2] **Sources:**

http://www.haryana-online.com/Flora/tun.htm

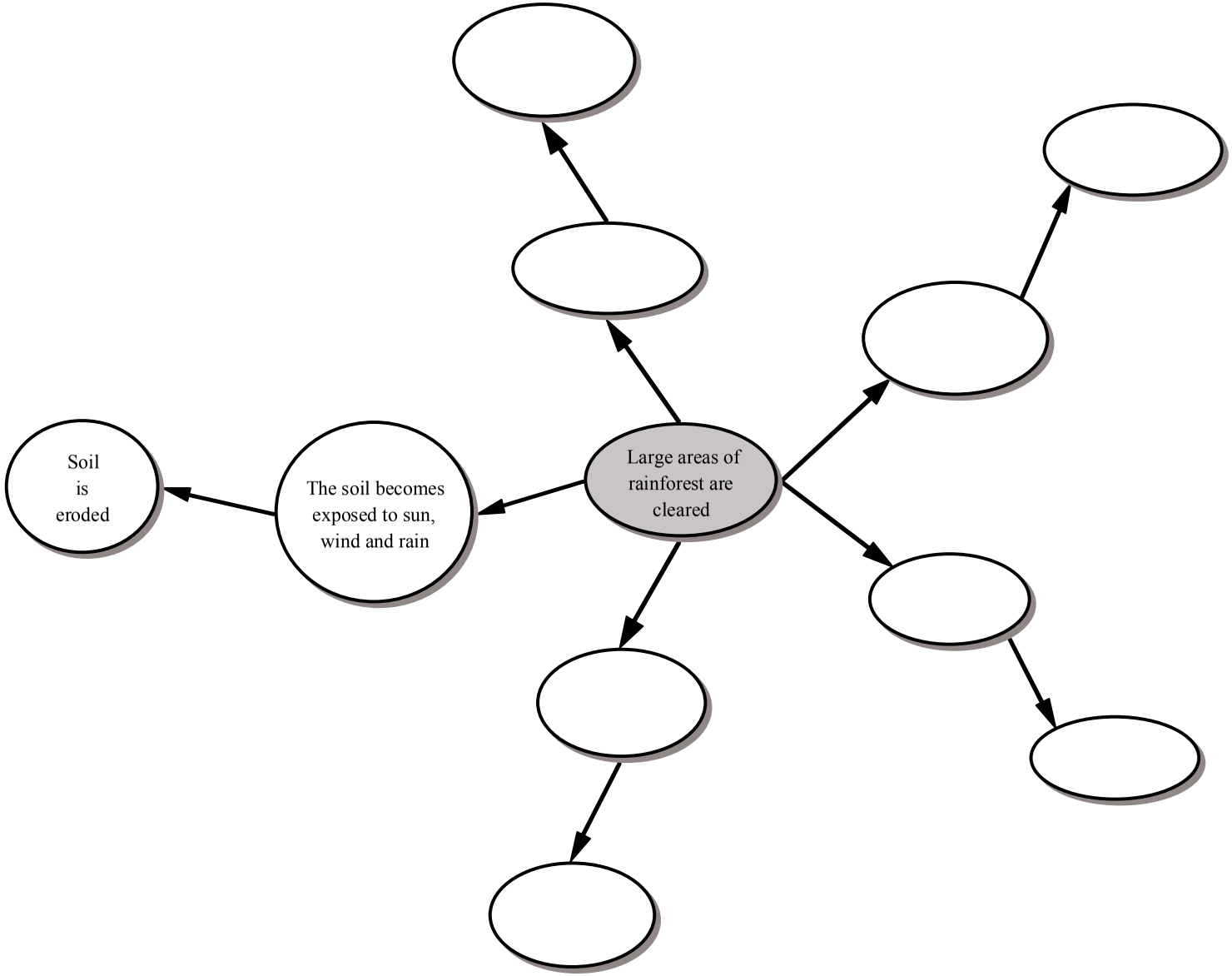
Agroforestree Database - http://www.worldagroforestry.org

			reddish dye, which is used for paper, clothes and matting. Medicine: In traditional medicine, a wood powder paste has been used against bilious headaches and swellings and internally against dermatitis or as a vermifuge. The charred wood soaked in poppy juice and made into a paste has been used to relieve the swelling of the eyelids. The bark has been used as an astringent and the wood as a hair tonic. Intercropping: Soya bean mixed with Teak not only makes the latter grow better but also allows harvesting of the bean for food; the soya stems, roots and leaves are added to the soil as fertilizer.
4	Kauri *Agathis philippinensis*	AUD 540 /cu m	Ecotourism: Kauri pine forest in many countries (e.g. New Zealand) attract visitors. Gum or resin: The species is tapped for its resin (traded as Manila copal).
5	Hoop pine *Araucaria cunninghamii*	AUD 1000/ cu m	Aesthetic: The tree is cultivated for ornamental purposes.
6	Malay Beechwood *Gmelina arborea*	AUD 240/ cu m	Food: The fruit of the Malay Beechwood is edible. Fodder: Leaves are regarded as good fodder and cattle Apiculture: Flowers produce abundant nectar, which produces high-quality honey. Tannin or dyestuff: Both wood ash and fruit yield a very persistent yellow dye. Medicine: Bark, leaves and roots contain traces of alkaloids and are used medicinally in its native range, such as in Hindu medicine. For example, both fruit and bark have medicinal properties against bilious fever. Other products: Recommended for silkworm culture.
7	Blackbean *Castanospermum australe*	AUD 900 cu m	Apiculture: The yellow-orange to reddish flowers are an important source of nectar and pollen for bees. Poison: Black bean seeds contain toxic

			saponins which are reportedly toxic to a serious pest of stored grain. Medicine: extracts from the seeds is used to treat hyperglycaemia in diabetic patients. They have also been shown to inhibit growth of the AIDS virus in tissue-cultured cells. Erosion control: Protects riverbanks and catchment areas in Australia. Shade or shelter: Planted in India, Sri Lanka & Malaysia as a shade tree and windbreak. Aesthetic: A valued ornamental tree, most attractive at flowering time with sprays of orange-red flowers. The large pendant, cylindrical, bean-like fruits are also conspicuous in the crown. The young plants are hardy indoor and patio plantings.
8	Keruing *Dipterocarpus grandiflorus*	AUD 220 /cu m	Gum or resin: The wood yields large quantities of resin called balau or minyak keruing, it is used locally as a coat for waterproofing paper, caulking baskets and boats, as a varnish for walls and furniture, in preparation of lithographic ink or, sometimes mixed with bark of Melaleuca trees for torches. Tannin or dyestuff: A tannin-formaldehyde adhesive is produced from bark extracts. Nitrogen fixing: The tree is associated with a fungi that helps to fix nitrogen in the soil. Erosion control: It minimizes soil erosion on slopes and resultant sedimentation of streams, lakes, and reservoirs. Soil improver: It also improves soil conditions through its fast rate of litter deposition and organic matter decomposition. Other services: Keruing forest can make up the biggest forest cover component of watersheds. It can store much of the rainwater and regulates its flow on the slopes to streams, lakes, and reservoirs for the irrigation of food crops and the generation of electricity to provide energy for homes and industry.
9	White Meranti *Shorea javanica*	AUD 210 /cu m	Gum or resin: The bark yields an unusually clear, pale yellow damar (resin). The resin was

			formerly used for torches, for caulking boats and handicrafts, and more recently local traders export it to industrial countries, where it is used principally in paints, varnishes and linoleum industries; it is also used in cosmetics, as a food additive and for medication. Soil improver: Roots are well strengthened by a fungi, which enables them to absorb and accumulate nitrogen, phosphorus, potassium and calcium.

Resource 13: Rainforest Futures Wheel



Resource 14: Values statements

Indicate whether you Strongly Agree (SA), Agree (A), are Undecided (U), Disagree (D) or Strongly Disagree with the following statements by placing a cross in the box. Be prepared to explain and give reasons for your opinion.

	SA	A	U	D	SD
All timber products should be labelled to indicate their source					
Australia should ban the import of all rainforest timber					
Some rainforest areas should be preserved just for wilderness areas					
In the future there will be no natural rainforest in South East Asia because of the demand for wood and wood products					
Rainforests in south East Asia do not need to be protected if we produce rainforest trees in plantations to replace them					
Deforestation in South East Asia has nothing to do with me personally					
Deforestation in south East Asia has nothing to do with Australia					

Source: Adapted from Department of Education, Queensland, 1994, Social Investigators: An approach to active and Informed Citizenship (Support Materials), p37.

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