

3.2 Life in the tropical rain forest -

The destruction of the tropical rain forest

Fachliche Inhalte

Raum und Ressourcen	Mensch und Raum	Raum und Zukunft
naturräumliche Voraussetzungen und Bedingungen, z.B.: Boden, Bodenbildung, Erosion Wasserhaushalt und Grundwasserbildung Wasserführung in den Jahreszeiten (Regen- und Trockenzeiten)	Veränderung der Landschaft durch den Menschen und ihre Auswirkungen Eingriffe in das ökologische Gleichgewicht und deren Folgen Nutzung technischer Möglichkeiten und ihre Auswirkungen auf das ökologische Gleichgewicht	Bedeutung einer "intakten" Umwelt für Mensch und Natur

Kommunikative Tätigkeiten/Arbeitsformen

- Sammeln von Informationen zum Thema "Baum"
- Aufarbeiten des Themas "Wald" biologisch und *ökologisch (fächerübergreifend mit dem naturwissenschaftlichen Unterricht)*;
- geographische Zuordnung von "tropical rainforests" und "temperate forests";
- Vergleich zwischen tropischem Regenwald und Wald in den gemäßigten Zonen;
- Erstellen einer Wandzeitung zum Thema "Tropische Regenwälder";
- Gestalten eines Bildes "Tropischer Regenwald" (*fächerübergreifend mit Kunst*);
- Erstellen eines Referates (Gruppenarbeit) über Produkte des tropischen Regenwaldes mit anschließender Präsentation;
- Informationsentnahme aus dem Gruppenreferat mit Hilfe von Stichwörtern;
- Informationsaustausch zwischen Schülergruppen;
- Gestaltung einer Ausstellung mit Produkten aus dem tropischen Regenwald
- Connections: Talking about products from the tropical rainforest which are around us
- Planspiel, Fallanalyse (Abholzung des tropischen Regenwaldes);
- Auswertung von Klimadiagrammen und Klimakarten;
- Auseinandersetzung mit aktuellen Texten

Materialien

LEHRWERKE

Jennings, T.: Tropical Forests: p. 4: Tropical forests; p. 5: Inside a tropical forest; p. 14: Forest soils; p. 17: Timber; p. 25: The Amazon forest; p. 26: Shifting cultivation; p. 27: The destruction of the Amazon forest; p. 28: The Congo forest; p. 32: The Australian tropical forests; p. 33: Plantations; p. 34: Rubber trees; p. 35: Making rubber; p. 36: Cacao trees; p. 37: Oil palms; p. 38: Coffee trees; p. 39: Sugar cane; p. 40: The disappearing forests

Jennings, T.: Temperate Forests: p. 8 A world of forests; p. 13: Using trees; p. 14: Felling trees; p. 15: Transporting felled trees; p. 17: Planting a forest plantation; p. 18: Fire; p. 26: Wood; p. 28: Paper; p. 29: Charcoal; p. 30: Apple orchards; p. 36: China and Japan; p. 39: The forests return

Ladybird Picture Atlas

Akinyemi, R.: Rainforests: p. 1: Rainforests; p. 2: Rainforests of the world; p. 4: Why rainforests are important; p. 6: People of the rainforests; p. 14: Money; p. 16: Disappearing forests; p. 18: The end?

Beddis, R.: A Sense of Place 2: p. 16: Rainforest

Beddis, R.: A Sense of Place. Workbook 2: p. 8: Rainforests

Beddis, R. u.a.: A Sense of Place. Alternative Workbook 2A: p. 7: The Amazonian rainforest is being developed

Beddis, R.: A Sense of Place 3: p. 8: Contrasts in development

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Biederstädt, W.: Around the World. Volume 1: p. 23: Tropical Rain Forests

Landesinstitut für Schule und Weiterbildung Soest - Otten, E./Thürmann, E. (Hrsg.): Tropical Rain Forests: p. 2: Entering the rain forest; p. 4: Weather and climate; p. 6: Abundant growth; p. 8: A fragile paradise; p. 10: The Yonomami - A case study; p. 12: Exploiting the rain forest; p. 14: Local effects of deforestation, p. 16: Global effects of deforestation

Wiegand, P.: The New Oxford School Atlas

Haigh, M.: New Routes in GCSE Geography Across the Developing World: p. 23: Brazil

Rose, D.: Basic Skills in Geography. Book 2

AUDIOVISUELLE MEDIEN

Dias, Filme (auch deutschsprachige) der Bildstellen

Filme

National Geographic:

An Introduction to Weather

Earth's Natural Resources: Can They Last?

The Forces of Nature

Interaktive Materialien/CD-Roms

Microsoft: Encarta 96 Encyclopedia

National Geographic:
Earth's Endangered Environments
Rain Forest

Poster

National Geographic:
Eye on the Environment
Tropical Rain Forest

Videos

National Geographic:
Ancient Forests
Old-Growth Forests

WEITERE MATERIALIEN

Landesinstitut Schleswig-Holstein für Praxis und Theorie der Schule (IPTS) (Hrsg.): Band 4: Materialien zum Bilingualen Unterricht Erdkunde. 7. Jahrgang/Gymnasium p. 149: Shifting Cultivation in the Tropical Rain Forest

Mayhew, S.: A Dictionary of Geography

Moffett, M. Tree Giants of North America. In: National Geographic 1/97

Planungsskizze:

Life in the tropical rain forest - The destruction of the tropical rainforest

Sachfachaspekte	Kommunikative Tätigkeiten/Aufgaben	Materialhinweise
<p>Rahmenplan Erdkunde, S. 28 ff.</p> <p>Umgang mit Atlas und Landkarten: geographische Zuordnung von "tropical rainforests" und "temperate forests";</p> <p>Produkte des tropischen Regenwaldes - Export nach Europa</p> <p>Problematik und Konsequenzen der Abholzung des tropischen Regenwaldes</p>	<ul style="list-style-type: none"> • Sammeln von Informationen zum Thema "Baum" • Aufarbeiten des Themas "Wald" biologisch und ökologisch (fächerübergreifend mit dem naturwissenschaftlichen Unterricht) • Vergleich zwischen tropischem Regenwald und Wald in den gemäßigten Zonen • Erstellen einer Wandzeitung zum Thema "Tropische Regenwälder" • Erstellen eines Referates (Gruppenarbeit) über Produkte des tropischen Regenwaldes mit anschließender Präsentation • Informationsentnahme aus dem Gruppenreferat mit Hilfe von Stichwörtern • Informationsaustausch zwischen Schülergruppen • Gestalten einer Ausstellung mit Produkten aus dem tropischen Regenwald • Connections: Talking about products from the tropical rainforest which are around us • Planspiel, Fallanalyse (Abholzung des tropischen Regenwaldes) • Auswertung von Klimadiagrammen und Klimakarten • Auseinandersetzung mit aktuellen Texten 	<p>Jennings, T.: Tropical Forests, p. 4 ff.</p> <p>Jennings, T.: Temperate Forests, p. 8 ff.</p> <p>Akinyemi, R.: Rainforests, p. 1 ff.</p> <p>Beddis, R.: A Sense of Place 2, p. 16</p> <p>Beddis, R.: A Sense of Place. Workbook 2, p. 8</p> <p>Beddis, R. u.a.: A Sense of Place. Alternative Workbook 2A, p. 7</p> <p>Biederstädt, W.: Around the World. Volume 1, p. 23</p> <p>Landesinstitut für Schule und Weiterbildung Soest: Tropical Rainforests, p. 2 ff.</p> <p>Video: Rainforest</p> <p>Products: pineapple, coffee, cacao, yams, rubber, tablets, sugar</p> <p>Map</p>

Life in the tropical rain forest -

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Tropical forests

All around the world there are large areas of tropical forest. They are all near the Equator. In places near the Equator the temperatures are high all year long. The only time it gets cooler is at night. There is also a lot of rain all the year round. Because of this the forests are often called tropical rainforests.

The largest areas of tropical forests are in South America and West Africa. But there are some tropical forests in Indonesia, Malaysia, southern India, Sri Lanka and Pakistan. Smaller pieces also occur in Australia and New Guinea.

Many useful things like rubber, Brazil nuts, bananas, coffee, cocoa and nutmegs come from tropical forest regions. So do some of our most valuable timbers. These include teak, mahogany and rosewood.

The Congo forest

The largest tropical forest in Africa is in the basin of the River Congo. This whole area was once a huge shallow lake. The Congo forests contain more kinds of plants and animals than any other part of Africa. This is the home of the gorilla, chimpanzee and many other kinds of apes and monkeys.

Much of the original tropical forest has been cleared. Some of it has been cleared to obtain valuable timbers like mahogany and iroko. The less valuable timber is used locally for building or firewood. Some of the timber is made into plywood or chipboard. The trees are being cut down faster than new ones can grow.

Large areas of the forest have been cleared so that huge fields of oil palm, rubber, bananas and cotton can be planted. Some of the forest has been cleared to obtain oil and minerals. Some has gone to make room for houses. Parts of the Congo forest have been set aside as national parks or nature reserves. But much of the forest is under threat.

The Australian tropical forests

Australia has only small patches of tropical forest left. The largest remaining areas are in the north-eastern corner of Queensland. Parts of these have been set aside as nature reserves. These tropical forests contain many eucalyptus trees. In the warm, wet forests they grow very tall up to 100m high.

Where the forest has been cleared, sugar cane and tropical fruits are grown. These crops grow rapidly in the warm, moist climate. Some cattle are also kept for their meat and milk.

(adapted from: Jennings, T.: Tropical Forests, p. 4ff)

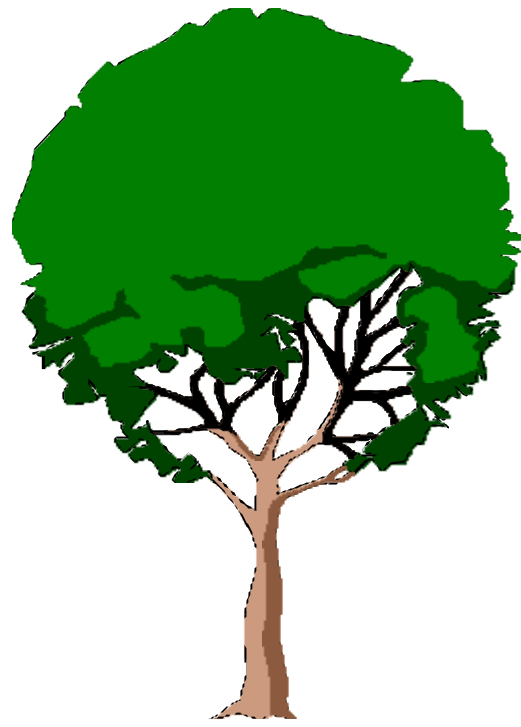
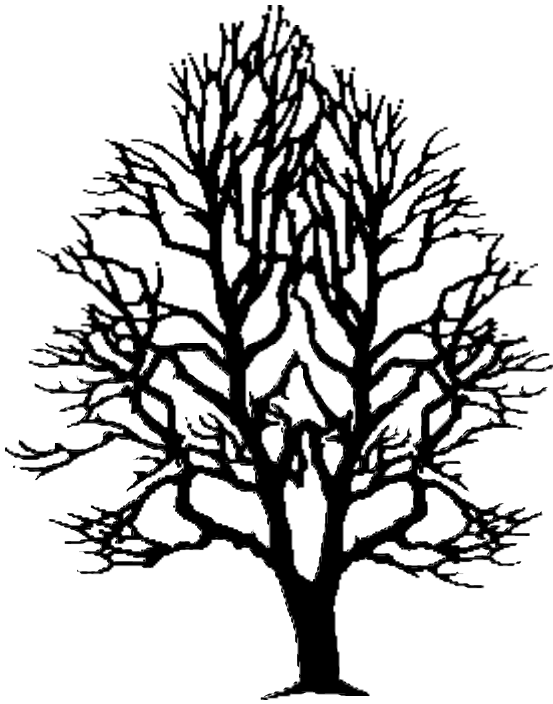


Mark the areas where there are tropical forests.



Find out more information about tropical forests in different parts of the world.

Parts of a tree



Write the following words in the right place in the trees above.

bark - blossom - branch - canopy - cone - crown - flower - fruit - hut - leaf/leaves - root - sap - sapling - seeds - seedling - timber - trunk - twig

Names of trees

redwood - mahogany - rosewood - birch - oak - maple - pine - chestnut...



There are lots more, can you find out more names of trees? Do you know how those trees look like? Fill in the following chart.

Trees in European forests	Trees in tropical rainforests

Inside a tropical forest

Tropical forests are sometimes called jungles. This is not a good name to use because not all of these forests are dense. Often they are dense only at the edges where the forest borders a river or clearing.

The inside of the forest is always dark. This is because the trees keep their leaves all the year round and only a little light reaches the ground. Only a few ferns and other plants can grow under the trees. One of the big differences between tropical forests and forests in the rest of the world is in the huge variety of trees. One hectare of forest in Europe often contains 10 or 12 kinds of trees. But a hectare of tropical forest may contain 200 kinds of trees.

The trees in a tropical forest are also very large and close together. They are often 60 m high and have a circumference of more than 5 m. Because the trees are evergreen, there are always leaves and fruits for animals to eat. And so there are many more kinds of animals, including birds and insects. Altogether, tropical forests are the home of almost half of the different kinds of plants and animals in the world. There are so many kinds of plants and animals in the tropical forests that some of them have not even been given names.

(adapted from: Jennings, T.: Tropical Forests, p. 5)



Make a list of differences and similarities between temperate and tropical forests.

	temperate forest	tropical rainforest



Find out the names of some plants and animals in tropical forests.



Make a list of products from the tropical rainforest you can buy in Germany.



Collect pictures and make a wallchart.

The structure of the evergreen tropical rainforest

In the temperate zones, most woodlands are dominated by a few types of trees such as oak, beech or maple. In the tropical rainforest there can be more than 200 species in a single hectare of land.

Because of the constantly high temperatures and heavy rainfall all kinds of plants grow very well. They produce fruits and flowers all year round. Some have fruits and flowers six or more times a year. On one tree, there may be buds and blossoms, ripe fruits and fading leaves - all at the same time. That is why the forest is called evergreen tropical rain forest. Most rain forest leaves are thick and waxy, with special drip-tips from which the heavy rain can easily run off. Some of these leaves are so big that they can be used as umbrellas.

The tropical rainforest consists of four distinct layers. The different light conditions at each level are the reason for this.

The *top or emergent layer* consists of the tallest trees. They can be over 50 m tall and have special roots that grow out of the bottom of the trunk to prop them up. These buttress roots help to keep the tree standing upright. There are usually one or two giant tree per hectare.

The next level is the *upper canopy level*. Most trees grow to the height of 30-40 m. The branches and leaves are all at the top. They grow so close together that their crowns overlap to form a dense canopy. The crowns of these trees are covered by moss, lichen and hundreds of flowering plants. These plants are called epiphytes. They do not harm the host tree, but simply use it as a place to grow to the light. Creepers or lianas hang from tree to tree. The whole forest is tight together by these woody climbing plants. The upper canopy layer is about 10 m thick. It lets only 5% of the sunlight pass through and two of ten raindrops.

The *lower canopy layer* is formed by medium-sized trees. They are shaped like candle flames and fight for sunlight as they push upwards. These young trees are often filled with lianas which root themselves in the ground and climb through the trees towards light and rain.

The *bottom level* is so dark that few plants can grow unless a big tree falls down and lets in the light. There is little vegetation on the ground. Giant ferns, shrubs, mosses that grow in dark and gloomy conditions can grow as high as 2 m. Together with the young trees, this lowest level reaches up to about 7 or 8 m.

On the *ground* there is a layer of dead leaves and branches. Because of the hot, wet climate, these quickly start to decay or rot away. Earthworms, ants or other small animals eat the leaves; bacteria and fungi break up the materials of the leaves and slowly change them into mineral salts in the soil. Here they become natural fertilisers. These nutrients are taken up by the roots and help the plants to grow.

The canopy is the home of many kind of animals. There are birds with brightly coloured feathers, like parrots, toucans hornbills and tiny humming-birds. The monkeys and sloths are difficult to see among the leaves. Scorpions, spiders and bees are found at all levels of the forest. There are no really big animals living in the forest. There are jaguars, anteaters and ocelots, but the tapir is the largest land animal. On the forest floor huge constrictors like the anaconda – with 12 m the longest snake in the world - wait for their prey. The floor is also the home of the beetles, ants, centipedes, snails, frogs and lizards.

(adapted from: Biederstädt, K.: Around the World, Volume 1, p. 27f.)



Paint a picture of the tropical rainforest and mark the different layers and their height.

- You are an explorer in the 'jungle', describe what you see.

Forest soils

People used to think tropical forest soils were fertile. This was because so many large plants grew there. We now know that most of the soils in the tropical forests are not very fertile. They give poor crops when the forest is cleared. This is because most of the mineral salts are in the trees. The trees also stop the soil from being washed away by the heavy rain.

When the forests are burned down, for a time the ashes act as a fertiliser for the crops. But all the earthworms, termites, ants, bacteria and fungi which turn the dead remains of plants into mineral salts are no longer needed, and they soon disappear. Soon the heavy rain washes away those mineral salts which are left in the soil. Few plants can then grow. And with no plants to protect the soil, the rain washes away the soil itself. And so the area becomes barren. With no trees to soak up the heavy rain, flooding of the lower ground often occurs. Great care has to be taken of the soil when a tropical forest is cleared.

(adapted from: Jennings, T.: Tropical Forests, p. 14)

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1. Why do people clear tropical forest?
2. What are the local effects of deforestation?

Plantations

In most parts of the world, large areas of tropical forest have been cleared to make way for huge farms, called plantations. Plantations grow one of the tropical crops. There are many of these including sugar, oil palm, cocoa, coffee, rubber, bananas, pineapples, cotton and rice. There are also a few plantations of timber trees such as teak. All of these crops are sold to countries overseas.

A lot of workers are needed on the plantations. Most of these workers have to be brought in from outside the forest areas. Special villages have to be built where the plantation workers can live.

The plants grown on the plantations are no longer the same as those which grow wild. They have been changed by scientists. The banana plant, for example, no longer produces seeds. New banana plants are grown from pieces cut off the old plants.

A lot of fertilisers have to be used on the plantations. This is because the soil is poor. With vast areas given over to one crop, pests and diseases can spread quickly. Chemicals have to be used to kill the weeds and pests.

(adapted from: Jennings, T.: Tropical Forests, p. 33)

? -

1. What plants are grown in plantations?
2. What are the advantages of plantations?
3. Do you see any risks?



Now work in groups to explain how one of the following crops are grown and used:

CACAO - OIL PALMS - COFFEE - SUGAR CANE - RUBBER

Using trees

Wood is one of our most valuable materials. People have always used wood. Even Stone Age people used wood for arrows, combs and the handles of stone tools. Wood was also used as a fuel.

Today wood is still an important fuel in many parts of the world. It is also used for buildings, fences and bridges. The walls of some houses are made from wood. But all houses have a lot of wood inside them. A great deal of wood goes into the house roofs. More is used in floors, doors and ceilings. Most furniture contains at least some wood.

We also use a number of other materials made from trees which grow in temperate forests. Cork, charcoal and turpentine come from such trees. Wood pulp is used to make paper and artificial silk or rayon.

(adapted from: Jennings, T.: Temperate Forests, p. 13)

– Make a list of things made out of wood.

Fire

The forest's worst enemy is fire. One of the most dangerous time for fires is the early spring when the last year's plants have become very dry. Of course, fire is also a danger during hot, dry weather. Some fires are started by lightning. But most are started because someone was careless. Cigarettes, matches and picnics stoves cause many fires.

Fire can spread quickly through a forest. Trees take many years to grow, but in a few minutes the whole forest can be destroyed.

(adapted from: Jennings, T.: Temperate Forests, p. 18)

? What are the reasons for forest fires?

The disappearing forests

The world's tropical forests are in great danger. They are being cleared at a faster rate than ever before to produce timber and firewood and also in order to grow food. They are being cleared to make room for houses, roads, farms and factories. Parts of the forest are being cut down to obtain oil and valuable minerals.

If people go on cutting down the forest by this rate, by the year 2000 only West Africa and the Amazon basin will have any tropical forest left. The groups of people who live in the forests will have lost their homes. Or they will have had to change their way of life. Some of the world's most interesting and beautiful plants and animals will have become extinct. Animals like the sloth, tiger, gorilla, jaguar, orang-utan and birds of paradise will have become extinct.

Trees purify the air we need to breathe. If too many trees are chopped down, the air in the forest changes. And this affects the weather. Some scientists are worried that if we cut down the big tropical forests, the whole of the world's climate may change.

(adapted from: Jennings, T.: Tropical Forests, p. 40)

? What are the consequences when forests disappear?

Development or destruction?

In the past decades over 10 000km of road have been driven through the Amazon forest to enable it to be settled and developed. Large areas have been burned and over 300 ranches with more than six million cattle created in their place - with a great deal of financial help of the government. Near Manaus vast patches of rainforest are being replaced by faster growing foreign tree species to feed a giant pulp mill. Over 35 000 people are employed on this huge enterprise, which is owned by an American multi-millionaire. Apart from these big ventures, the Brazilian government has settled over a million colonists from poorer parts of the country. Many are peasant farmers struggling hard, but others have quite prosperous farms growing crops of coffee, cocoa, palm oil and soys, especially along the more fertile river banks.

But here is a price to pay. It has been calculated that about one fifth of the rainforest has already been destroyed, and at the present rate of clearing there will be little left in 25-30 years time. This would not only be a waste of valuable timber, but such a massive lost of forest could affect the oxygen and carbon dioxide balances in the atmosphere - with unknown possible disastrous results. Most of the soils are not rich, and without forest cover would soon deteriorate or be lost. The few remaining Indians will either be exterminated, find themselves on reserves or drift into urban slums.

It is estimated that all over the world the tropical rainforests have already been reduced to about sixty per cent of their original size. The main threats are from logging, clearing for farming and settlement, and for mining. Clearly such massive change cannot go on for very much longer. Not only will the millions of people who live in and from the forests have to change their way of life. Just as important in the long run is the possible effect on soil, landscape and climate. There is ample evidence to suggest loss of trees on the present scale will lead to soil erosion, a wasteland of useless vegetation, widespread flooding, changes in rainfall pattern and perhaps even a change in the composition of the atmosphere. The forests and minerals in equatorial climates are valuable resources, but if they are wastefully or carelessly used they will be lost for ever.

(adapted from: Beddis, R.: A Sense of Place 2, p. 20ff. and: Jennings, T.: Tropical Forests, p. 17)

- What are the global effects of deforestation?



A role play (Group discussion): Protection or destruction?

Imagine you are:

- *a group of Amazon Indians*
- *a group of officials from a logging company*
- *a group of international journalists*

The logging company wants to buy a remote area in the rainforest where the Indians live. This is an area where they want to make a lot of money. They want to start working there maybe in one year, maybe in five years; this depends on the price of the timber - so they do not know yet. - Government officials have promised the Indians that nothing will happen to their land in the (near) future. The Indians do not trust them and are angry. - The journalists are looking for a good story.



Discuss the pros and cons of logging.

There are arguments from the logging companies on the one hand and from ecologists on the other. What is your opinion?

Wordfield TROPICAL RAINFOREST

climate/weather

people

places

plants

TROPICAL RAINFOREST

animal life

products

deforestation

ASPECT

tree roots

soil

high surface runoff

loss of canopy

the effects of ...

erosion

higher evaporation

to fell giant trees

humus layer

logging companies

a clearing

branches/leaves

tree trunk

DEFORESTATION

hardwood

to clear the forest

surrounding forest

timber lianas in diameter

sawmills

to exploit the forest

destruction

charcoal

vicious circle

global effects

(plant/animal) species

to die out

long term/short term effects

Life in the tropical rain forest - The destruction of the tropical rain forest

Vocabulary

buttres root	Blattwurzel	unauthorized	unerlaubt
to calculate	berechnen	venture	Wagnis
careless	sorglos	wasteful	verschwenderisch
caterpillar	Raupe	wasteland	Ödland
charcoal	Holzkohle		
chimpanzee	Schimpanse		
circumference	Umfang		
close nah			
colonist	Siedler		
to employ	beschäftigen, anstellen		
enterprise	Unternehmen		
evidence	Beweis		
exterminated	ausgerottet		
financial	finanziell		
firewood	Feuerholz		
foreign	fremd		
furniture	Möbel		
to handle	umgehen		
jungle	Dschungel		
logging company	Holzfirma		
lynx	Luchs		
mahogany	Mahagoni		
matches	Streichhölzer		
material need	materielles Bedürfnis		
monkey	Affe		
paradise	Paradies		
patch	Fleck		
peasant	Kleinbauer		
plywood	Sperrholz		
prosperous	wohlhabend		
pulp	Papierbrei		
rayon	Kunstseide		
silk	Seide		
slash and burn			
clearance	Brandrodung		
sloth	Faulheit, Faultier		
to suggest	vorschlagen		
termite	Termite		
turpentine	Terpentin		