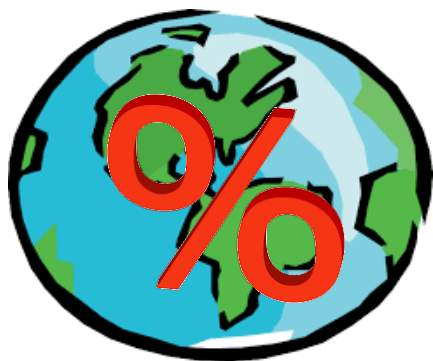


Investigate the Rainforest Biome!



What percentage of the Earth is covered by rainforest?
= _____

CONSTRUCT A COLUMN GRAPH!

Use the data in the table below to construct a column graph that shows the amount of rainforest in each country.

REMEMBER to label the axes and units of measurement!

COUNTRY	AREA OF RAINFOREST (million hectares)
Brazil	533.0
Democratic Republic of Congo	135.2
Indonesia	105.0
Angola	69.8
Peru	65.2
India	60.9
Papua New Guinea	30.6
Malaysia	19.3
Madagascar	11.7

TITLE: _____



TROPICAL RAINFOREST

Describe where tropical rainforests are located.

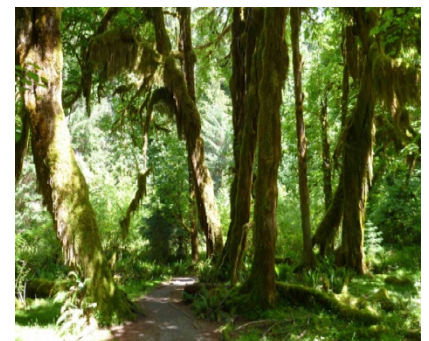


Types of tropical rainforests...

TYPE	DESCRIPTION
Lowland rainforests	<hr/> <hr/> <hr/> <hr/>
Montane forests	<hr/> <hr/> <hr/> <hr/>
Cloud forests	<hr/> <hr/> <hr/> <hr/>
Swamp or flooded forests	<hr/> <hr/> <hr/> <hr/>

TEMPERATE RAINFOREST

Describe where temperate rainforests are located.



Complete the map below!

- ⇒ Madagascan Rainforest



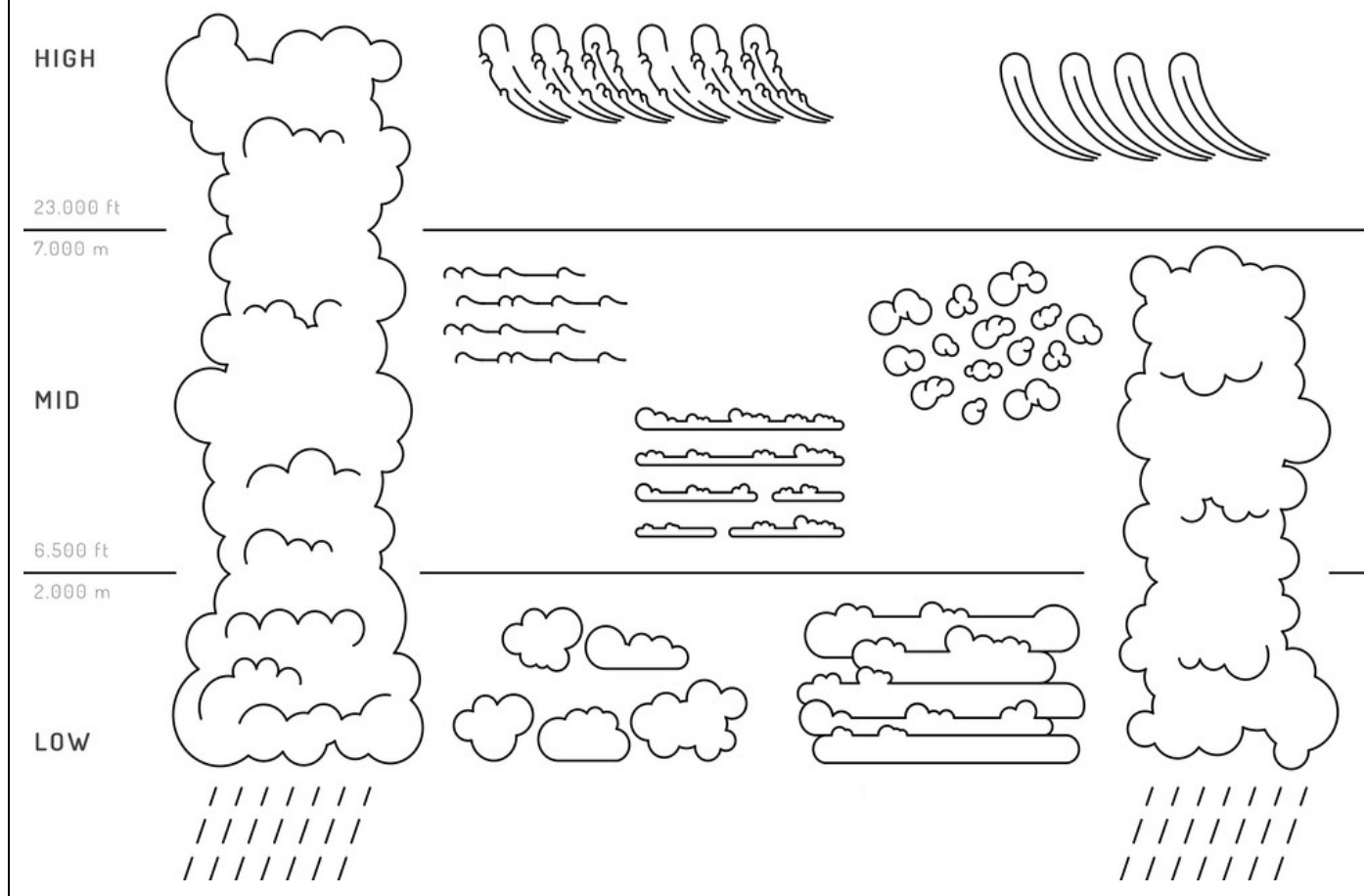
In tropical regions the sun shines for approximately the same time and intensity every day, all year round. Due to its latitude, sunlight shines on the Amazon at about a 90° angle, resulting in intense solar energy. This means that it is usually warm- ranging from 20°C to 34°C- and there is little variation in temperature throughout the year. The Amazon also experiences high rainfall of 2-10 metres per year.

Paragraph- Explain convectional rainfall.

[illegible]

TYPES OF CLOUDS

1. Circle the image that best represents a cumulonimbus cloud.
2. Conduct some research to help you name the remaining types of clouds.



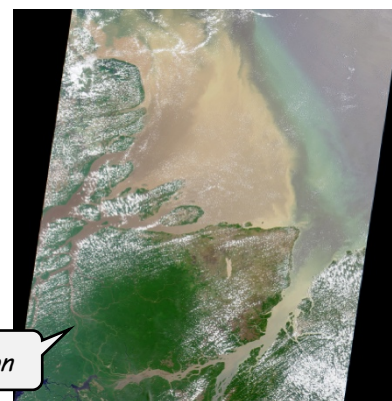
CHALLENGE TIME!



Woronora Dam, Sutherland Shire, NSW

The Amazon River has a daily discharge at its mouth of around 30.3 million megalitres per day.

NASA's Earth Observatory- Mouth of the Amazon

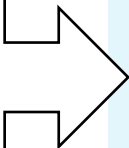


How many hours would it take for the Amazon River to fill all the dams used to supply Sydney with water if the dams were completely empty?

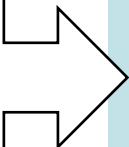


Show working out...

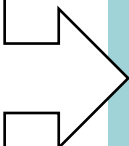
LAYERS OF THE RAINFOREST...



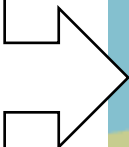
Emergents



Canopy



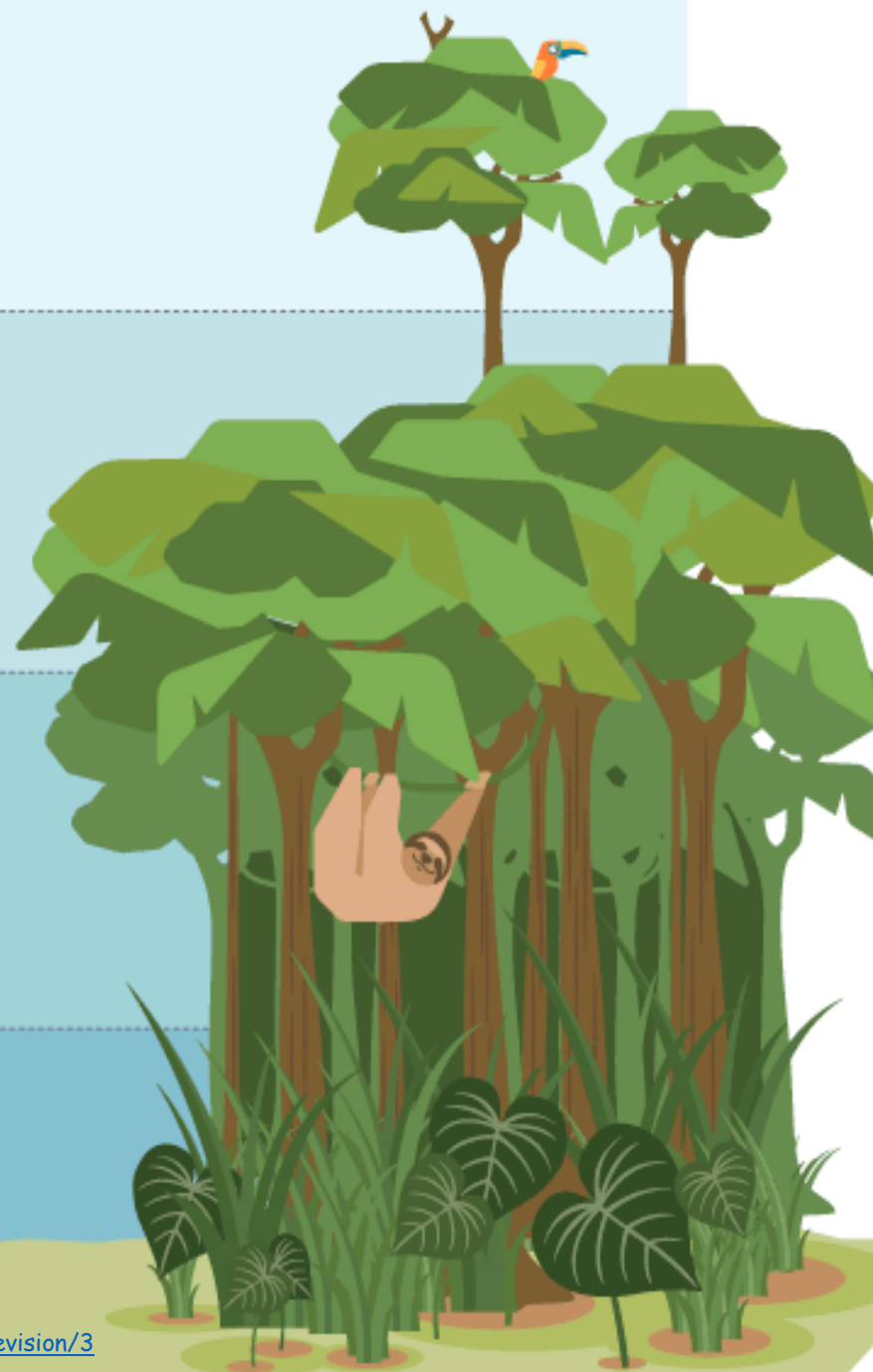
Under canopy



Shrub level

Image sourced from:

<https://www.bbc.co.uk/bitesize/guides/zscsmnb/revision/3>



PLANTS AND ANIMALS OF THE RAINFOREST...

Determine which layer of the rainforest each of the following plants and animals belong to.

The Kapok Tree belongs to the _____ layer
of the rainforest.



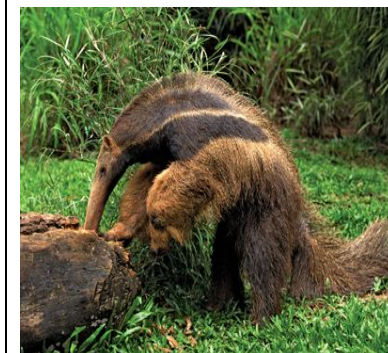
The Greater Bulldog Bat
belongs to the _____ layer
of the rainforest.

The Sloth belongs to the _____ layer
of the rainforest.

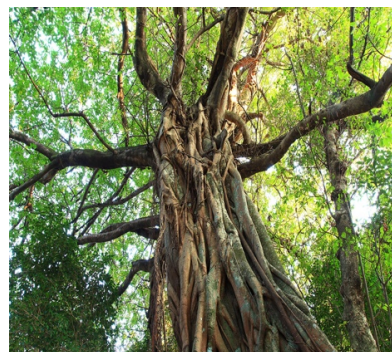


The Philodendron belongs to
the _____
layer of the rainforest.

The Giant Anteater belongs
to the _____ layer
of the rainforest.



The Harpy Eagle belongs to
the _____
layer of the rainforest.



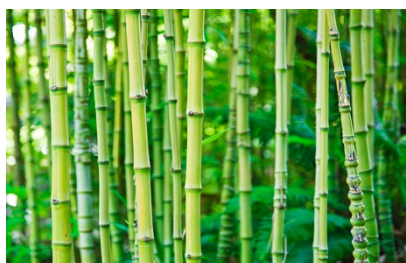
The Strangler Fig belongs to
the _____
layer of the rainforest.

The Heliconia belongs to the _____ layer
of the rainforest.



The Hercules Beetle belongs
to the _____
layer of the rainforest.

The Sparkling Violetear
belongs to the _____
layer of the rainforest.



How many centimetres can bamboo grow in the rainforest in one day?

= _____



THE RAINFOREST PRODUCES FOOD...

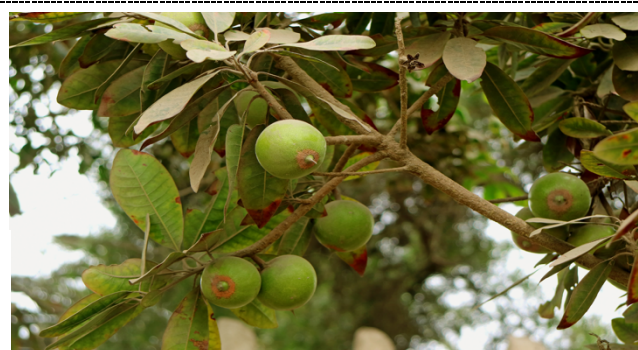
[List foods that you consume that originally derived from the rainforest]

Fruit	Grains	Nuts	Vegetables	Spices

Investigate the following foods:

- ⇒ Acai berries
- ⇒ Maca
- ⇒ Maqui berries
- ⇒ Camu Camu
- ⇒ Lucuma

1. Map where these foods grow in South America.



2. What are the traditional uses for;

⇒ Maca?

⇒ Camu Camu?

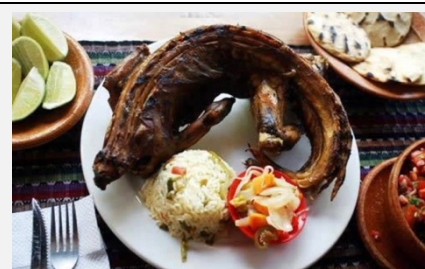
3. What properties do some of these foods possess?

Animals in the rainforest are also seen as sources of food...

The giant ditch frog and green iguana are being consumed for their chicken-like meat!

THE FACTS ON IGUANA MEAT:

- ⇒ The iguana is a delicacy in Mexico and Central and South America
- ⇒ Iguana is served in several trendy US restaurants- e.g., iguana popcorn nuggets
- ⇒ It is high in protein and low in fat
- ⇒ Iguana meat is well-suited for tacos, burritos, curries, soups, stews, etc.



Sourced from: <https://www.usatoday.com/story/news/nation/2020/01/24/falling-iguanas-meat-sales-people-eat-chicken-trees/4553457002/>

BUSHMEAT TRADE



What is the "bushmeat trade"?

Why has the bushmeat trade grown?

To help you answer this question, watch *Illegal Commercial Bushmeat Trade* at:

<https://www.youtube.com/watch?v=56jJsHJFIm8>.

How much is the bushmeat trade industry worth?

In Kinshasa, The Democratic Republic of Congo, it is possible to purchase the meat of almost any forest animal.

In Australian dollars:

- ⇒ 1 kilogram of elephant meat costs \$1.50
- ⇒ A whole smoked chimpanzee costs up to \$30
- ⇒ A whole gorilla costs up to \$200
- ⇒ A pouched rat costs \$1
- ⇒ A monkey costs \$7.50



Label the following on the map of Africa:

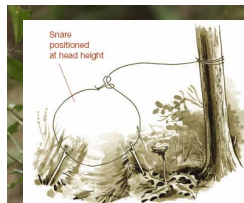
- Democratic Republic of Congo
- Kinshasa

A Kinshasa hunter who sells ONE gorilla will give them one-quarter of their annual income!

PROPOSE A SOLUTION!

Hunters are resistant to stop participating in the bushmeat trade.

Propose a solution that stops the bushmeat trade AND supports the hunters.



This chimpanzee was injured by a hunter's snare



DEFORESTATION OF THE RAINFOREST...

What is deforestation?



Deforestation is the deliberate removal of forests. This is done by cutting down trees and shrubs, starting fires and removing too many trees during logging.

Between 1990 and 2015, the world lost

129 million ha of forest



An area the size of South Africa

This happens so that the land can be used for other things- *e.g., soybean crops, grazing cattle, mining and the development of towns and cities.*

Deforestation destroys the habitats of many flora and fauna species.

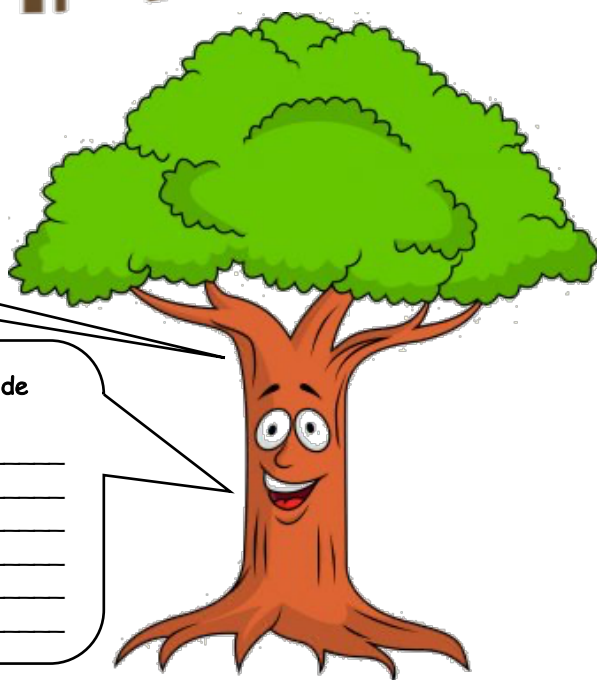


1km of rainforest is home to over 1000 species!

How much carbon dioxide does the Amazon rainforest absorb per year?

= _____

If deforestation continues, what impact will this have on carbon dioxide levels in the atmosphere?



Setting a value on nature is a complex process, and certainly not without its critics, but it offers a way to make decisions about natural resources such as rainforests.

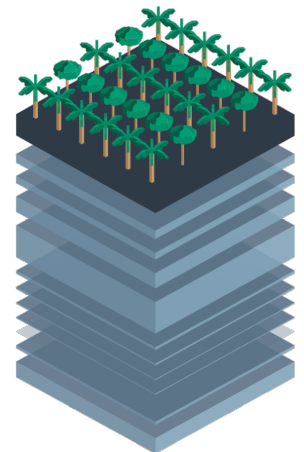


Academics in the US and the Netherlands have calculated the economic value of Leuser National Park in Sumatra, Indonesia – one of the two remaining habitats for Sumatran orangutans – which is under threat of deforestation for the cultivation of palm oil and rubber. They calculated the value of the forest to people in the region over a 30-year period if it were protected, and the value if it were destroyed for logging and subsequent cultivation.

COMPARING ECOSYSTEM BENEFITS-
value per hectare/per year

Conservation
Value per hectare/per year

Deforestation for cultivation
Value per hectare/per year







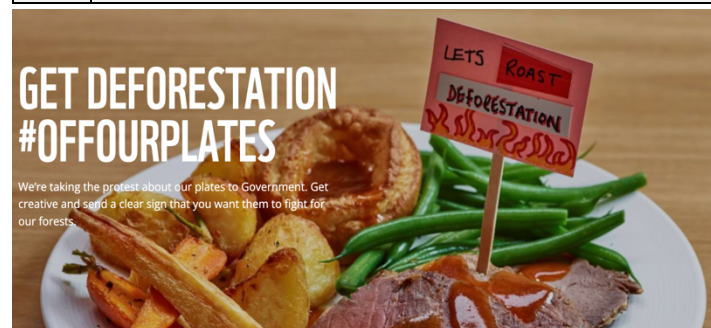
ARGUMENTS AGAINST

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There is no handwriting or other markings on the paper.This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

DEBUNKING MYTHS ABOUT DEFORESTATION!

Visit WWF's *10 Myths About Deforestation* webpage at: <https://www.wwf.org.uk/10-myths-about-deforestation#:~:text=Myth%201.&text=While%20growing%20demand%20for%20wood,accounted%20for%2073%25%20of%20deforestation> AND record WHY these myths about deforestation are just that- MYTHS!

NO.	MYTH	DEBUNK THE MYTH- EVIDENCE
1	 <p>Most trees are cut down for paper or wood</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
2	<p>Deforestation is inevitable- <i>there are too many people to feed</i></p> 	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
3	 <p>Beef is the only food that causes deforestation</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
4	<p>Boycotting products that contain palm oil will help stop deforestation</p> 	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>



ACTIVITY TIME- Get Deforestation #OffOurPates!

While we can try our best to eat more sustainably, there's no way of knowing where deforestation might be hiding in our food. Our government has the power to take deforestation #OffOurPlates!

Using recycled materials, design your own placard for your school lunch.

Think about what you'll be eating. If it's meat or dairy, the supply chain may well have included soy. If it's vegan it may contain unsustainable palm oil. Then conjure up your best food jokes and puns.

Just remember, you don't want any of your food to cause deforestation.



PALM OIL...

Palm oil is an edible vegetable oil. It comes from the fruit of oil palms. This oil is used in food manufacturing, cosmetics, biofuel, etc.



71%

Food products



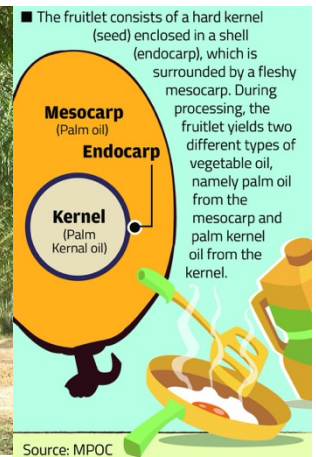
24%

Consumer goods



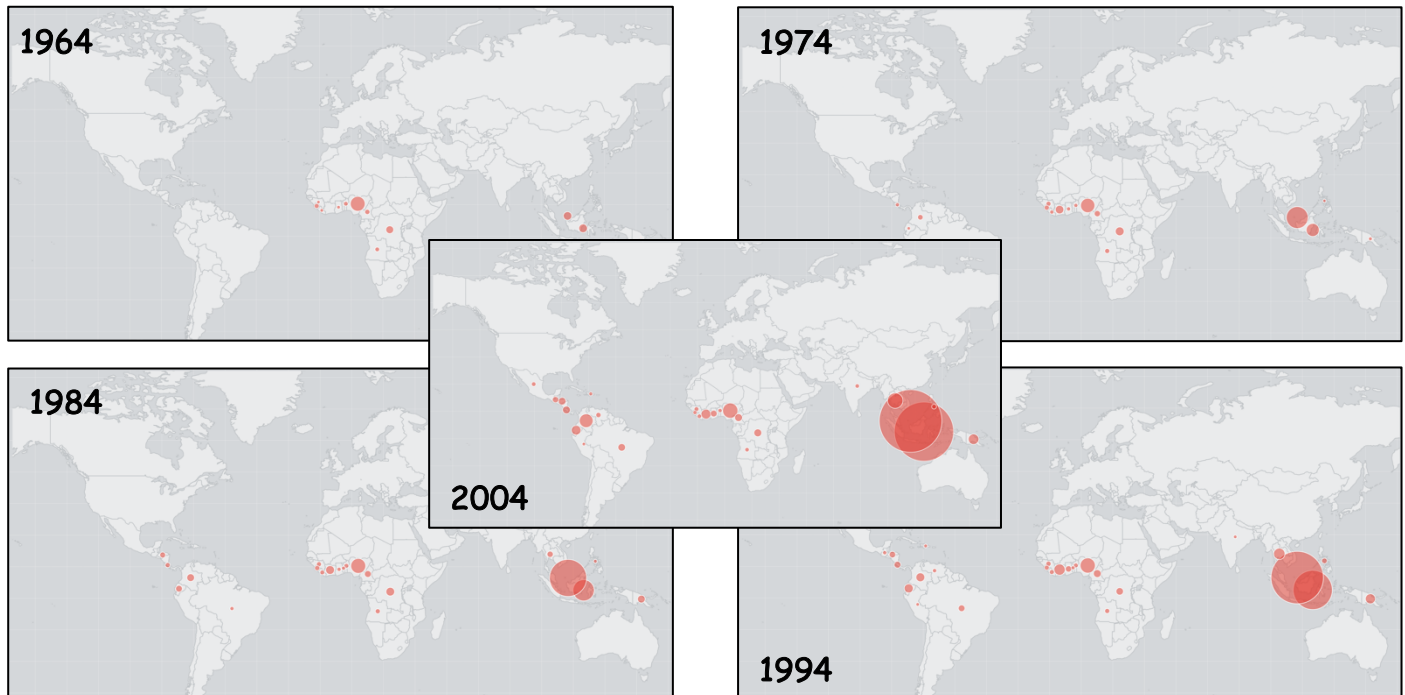
5%

Energy



Source: MPOC

PALM OIL PRODUCTION BY COUNTRY [in metric tonnes (MT)]



Visit The Guardian's *Rainforest Interactive- Palm Oil Production by Country* at:

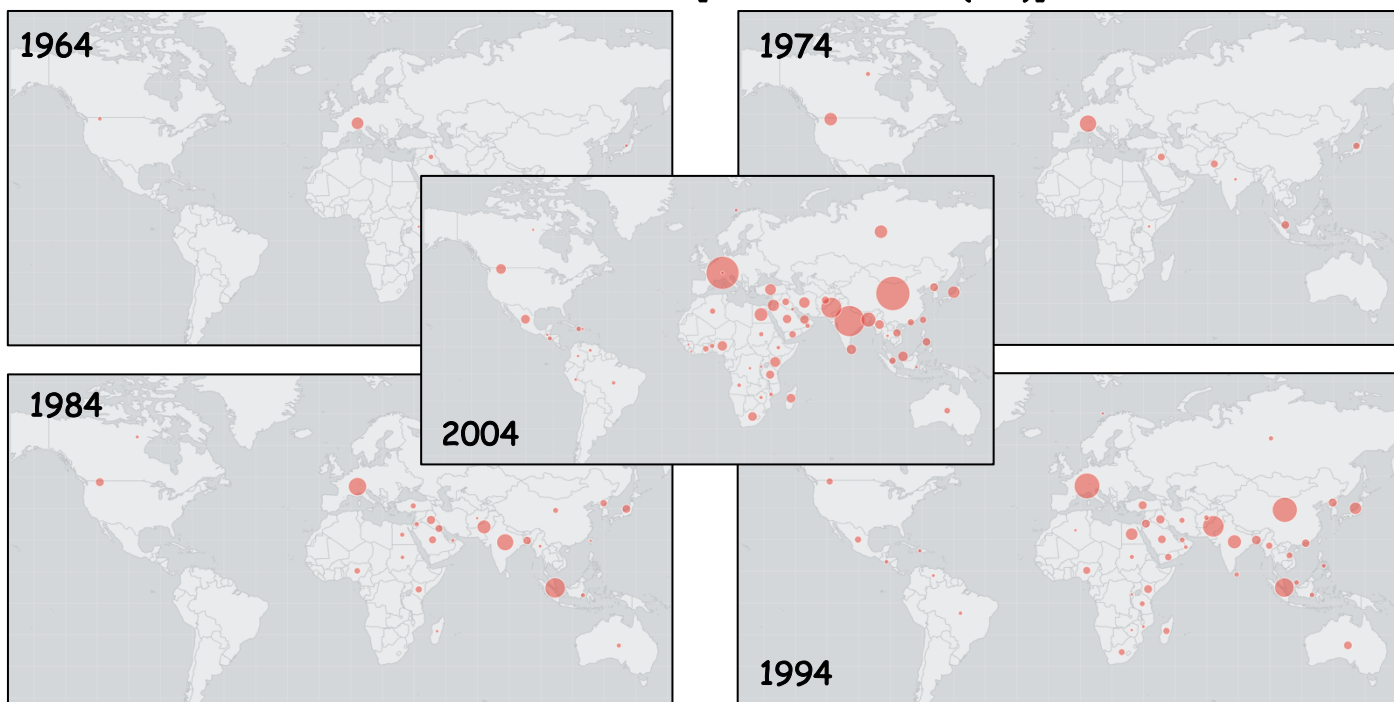
<https://www.theguardian.com/sustainable-business/ng-interactive/2014/nov/10/palm-oil-rainforest-cupboard-interactive>.

1. Label the countries that produced palm oil in 2014
2. Draw in the metric tonnes (MT) produced by each of these countries

2014



PALM OIL IMPORTS [in metric tonnes (MT)]



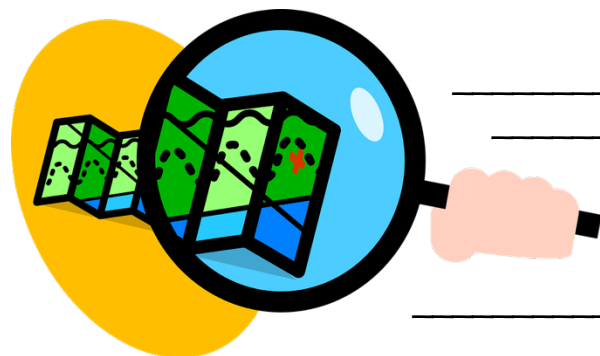
Visit The Guardian's *Rainforest Interactive- Palm Oil Imports* at: <https://www.theguardian.com/sustainable-business/ng-interactive/2014/nov/10/palm-oil-rainforest-cupboard-interactive>.

1. Label the countries that imported palm oil in 2014
2. Draw in the metric tonnes (MT) imported by each of these countries

2014

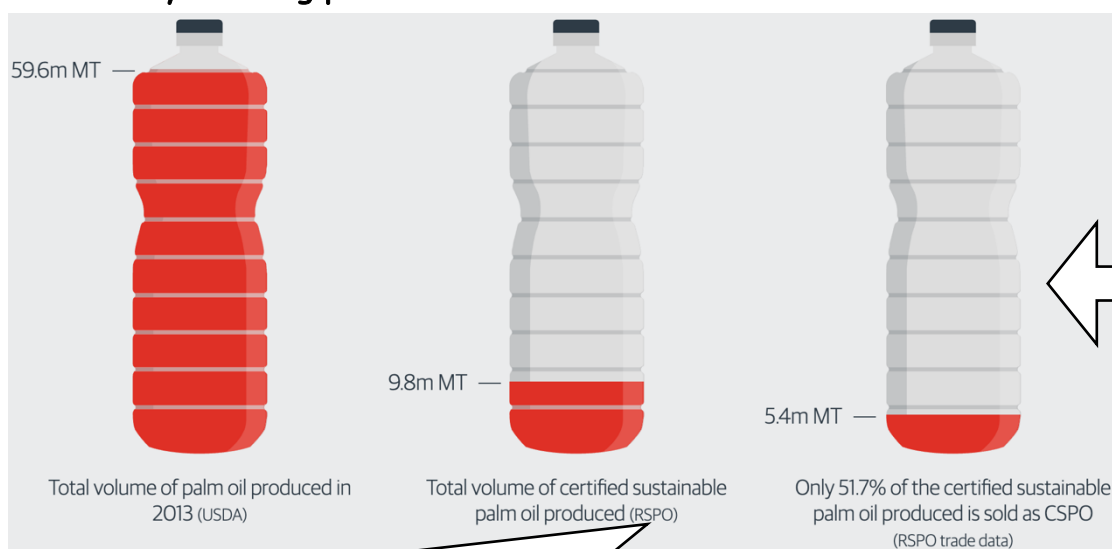


MAKE OBSERVATIONS...



What do you notice about the two maps?

Sustainably sourcing palm oil...



Write an informative caption for this graph.

RSPO stands for... _____

Visit <https://rspo.org/about> to help you outline what RSPO is all about.

IKEA- Palm Oil

- ⇒ IKEA uses approximately 29,000 tonnes of palm oil annually. About 90% of the total volume is used in home furnishing products, mainly in candles. Around 10% can be referred to food. IKEA suppliers currently buy palm oil mainly from Malaysia and Indonesia.
- ⇒ Since 2015, 100% of the palm oil used in our home furnishing products such as candles is certified sustainable palm oil from segregated RSPO sources. In total we use approximately 99.9% palm oil from more sustainable sources. Our goal is 100%.
- ⇒ The Roundtable on Sustainable Palm Oil (RSPO) is a multi-stakeholder organisation whose mission is to advance the production, procurement, finance and use of sustainable palm oil products. IKEA is an active member of RSPO.
- ⇒ Until we have reached 100% certified segregated palm oil, we buy RSPO Credits for the volume not secured as segregated. Buying credits supports sustainable palm oil production at the plantation level.



Sourced from: <https://about.ikea.com/en/about-us/our-view-on/palm-oil>

Explain what RSPO credits are.

Visit RSPO's webpage *What is a Credit?* at: <https://www.rspo.org/rspo-credits/introduction>.





Palm Oil in Disguise!

It is incredibly difficult to avoid palm oil. This is because products often do not list "palm oil" as an ingredient.

Currently, only three vegetable oils **MUST** be labelled in food products in Australia and New Zealand. **These are- peanut oil, sesame oil and soybean oil.**

This means, palm oil is often disguised. **Below is a list of ingredients that is commonly derived from palm oil or have palm content.**

Please note: Palm sugar and vegetable gum is NOT palm oil!

Acetic and fatty acid esters of glycerol	Emulsifying wax	Octyl stearate	Sodium lauryl glucose carboxylate
Alkyl Poly Glucoside	Epoxidized palm oil (uv cured coatings)	Octyldodecyl myristate	Sodium lauryl sulfate
Aluminium stearate	Ethyl lauroyl arginate (243)	Octyldodecyl stearoyl stearate	Sodium lauryl sulfoacetate
Aluminium, calcium, sodium, magnesium salts of fatty acids	Ethylene glycol monostearate	Oleamide MIPA	Sodium lauryl sulphate
Ammonium laurath sulphate	Ethylhexyl hydroxystearate	Oleic acid	Sodium palm kernelate
Ammonium lauryl sulphate	Ethylhexyl Palmitate	Oleyl betaine	Sodium palmitate
Arachamide mea	Ethylhexyl palmitate	Palm fruit oil	Sodium palmitate
Ascorbyl palmitate (304)	Ethylhexyl stearate	Palm kernel oil	Sodium stearate
Ascorbyl stearate	Ethylhexylglycerin	Palm oil	Sodium stearoyl lactylate
Azelaic acid	Fatty acids	Palm olein	Sorbitan isostearate
Butyl stearate	Fatty alcohol sulphates	Palm stearine	Sorbitan laurate
Calcium lactylate	Glycerin	Palmitate	Sorbitan monostearate (491)
Calcium oleyl lactylate	Glycerin or glycerol (442)	Palmitate	Sorbitan oleate
Calcium stearate	Glyceryl distearate	Palmitic acid	Sorbitan palmitate
Calcium stearoyl lactylate	Glyceryl laurate	Palmitamidopropyltrimonium chloride	Sorbitan sesquioleate
Capric triglyceride	Glyceryl monostearate	Palmitoyl myristyl serinate	Sorbitan trioleate
Caprylic acid	Glyceryl myristate	Palmitoyl oxostearamide	Sorbitan tristearate
Caprylic / Capric Glycerides	Glyceryl oleate	Palmitoyl oligopeptide	Sorbitan tristearate (492)
Caprylic triglyceride	Glyceryl polymethacrylate	Palmitoyl tetrapeptide-3	Stearalkonium chloride
Caprylic/capric triglyceride	Glyceryl Rosinate	Pentaerythrityl tetraistostearate	Stearalkonium hectorite
Caprylic/capric/stearic triglyceride	Glycol distearate	Peptide complex	Stearamide MEA
Capryloyl glycine	Glycol stearate	Polyethylene (40) stearate (431)	Stearamidopropyl dimethylamine
Caprylyl glycol	Guineesis (palm)	Polyglycerol esters of fatty acids	Steareth-10
Carotene (Sometimes made from palm)	Hexadecylic	Polyglycerol esters of	Steareth-2
Castile soap (often from palm)	Hexyl laurate	interesterified ricinoleic acid	Steareth-20
Ceteareth (2-100)	Humectant glycerol	Polyglycerol-2 oleyl ether	Steareth-21
Cetearyl alcohol	Hydrogenated palm glycerides	Polyglyceryl-3 dilisostearate	Stearic acid (vegetable oil)
Cetearyl ethylhexanote	Isopropyl isostearate	Polyglyceryl-4 isostearate	Stearic acid or fatty acid (570)
Cetearyl glucoside	Isopropyl palmitate	Polyglyceryl-4 oleyl ether	Stearoyl sarcosine
Cetearyl isononanoate	Isopropyl titanium triisostearate	Polysorbate 60 or polyoxyethylene (20) sorbitan monostearate	Stearyl alcohol
Ceteth-20	Isostearamide DEA	Polysorbate 65 or polyoxyethylene (20) sorbitan tristearate	Stearyl dimethicone
Ceteth-24	Isostearate DEA	Polysorbate 80 or polyoxyethylene (20) sorbitan monooleate	Stearyl heptanoate
Cetyl acetate	Isostearic acid	Polysorbate-20	Sucrose stearate
Cetyl alcohol	Isostearyl alcohol	Polysorbate-40	Sucroseesters of fatty acids
Cetyl ethylhexanoate	Lactic and fatty acid esters of glycerol	Polysorbate-80	Taxanomic
Cetyl hydroxyethylcellulose	Lauramide DEA	Polysorbate-85	TEA-lauryl sulphate
Cetyl lactate	Lauramide MEA	Potassium stearate	TEA-stearate
Cetyl octanoate	Lauramine oxide	PPG-15 stearate ether	Tocopheryl linoleate
Cetyl palmitate	Laureth	Propylene glycol esters of fatty acids	Triacetin
Cetyl ricinoleate	Lauric acid	Propylene glycol laurate	Triacetin (1518)
Citric and fatty acid esters of glycerol	Lauryl sarcosine	Propylene glycol stearate	Tribehenin
Cocoa butter equivalent (CBE)	Lauryl betaine	Retinyl palmitate	Tricaprylin
Cocoa butter substitute (CBS)	Lauryl lactate	Saponified elaeis guineensis	Tristearin
Cocamide DEA	Lauryl glucoside (from palm)	Sleareth	Vegetable glycerin
Cocamidopropyl betaine	Lauryl pyrrolidone	SLES	Vegetable Oil
Decyl Glucoside	Linoleic acid	SLS	Vitamin A palmitate
Decyl oleate	Magnesium myristate	Sodium cetearyl sulphate	Zinc stearate
Diacetyltartaric and fatty acid esters of glycerol	Magnesium stearate	Sodium Dodecyl Sulphate (SDS or NaDS)	
Dilinoic acid	Mixed tartaric, acetic and fatty acid esters of glycerol	Sodium Isostearoyl Lactylate	
Disodium laurath sulfosuccinate	Mono-and- di-glycerides of fatty acids	Sodium lactylate; sodium oleyl lactylate; sodium stearoyl lactylate	
Distilled Monoglyceride Palm	Mono-glycerides of fatty acids	Sodium laurate	
Elaeis guineensis oil	Myristate	Sodium laurel	
Emulsifiers: E304, E422, E430, E431, E432, E433, E434, E435, E436, E470, E470a, E470b, E471, E472, E472a, E472b, E472c, E472e, E472f, E473, E474, E475, E476, E477, E478, E479, E480, E481, E482, E483, E493, E494, E495	Myristic acid	Sodium laureth sulfate	
	Myristic Cetrimonium Chloride Acid	Sodium laureth sulphate	
	Myristoyl	Sodium laureth-13 carboxylate	
	Myristyl alcohol	Sodium lauroyl lactylate	
	Myristyl myristate	Sodium lauryl	
	Octyl palmitate	Sodium lauryl ether sulphate	



Sourced from: <https://thelincolnpantry.co.nz/palm-oil-in-disguise/>

LET'S GET SHOPPING...

ACTIVITY TIME- Let's get shopping



1. Visit Coles online at <https://shop.coles.com.au/a/national/home>.

2. Use the search bar to help you locate the grocery items identified in the table below.

coles

Search for a product e.g. milk



Search for a list of items

3. Carefully read the ingredients list for each grocery item- *does the product include palm oil?*

[Hint: refer to the previous page for a list of ingredients that is commonly derived from palm oil or has palm content]

4. Record your findings.

<p>Fantastic Beef Noodle Cup, 70g</p> 	<p>Arnott's Original Chocolate Tim Tam, 200g</p> 	<p>Nutella Hazelnut Chocolate Spread, 750g</p> 	<p>Bega Smooth Peanut Butter, 780g</p> 	<p>Hershey's Cookies and Crème Sticks 4 Pack, 360ml</p> 
<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>
<p>Coles Baker Super Soft White Sandwich Loaf, 680g</p> 	<p>Meadow Lea Original Margarine Spread, 500g</p> 	<p>Betty Crocker Devil's Food Cake Mix, 540g</p> 	<p>Kellogg's Coco Pops Chocolatey Breakfast Cereal, 650g</p> 	<p>Lindt Cornet Assorted, 333g</p> 
<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>
<p>OMO Sensitive Top and Front Loader Laundry Liquid Detergent, 2L</p> 	<p>Palmolive Naturals Replenishing Milk and Honey Soap, 4 pack</p> 	<p>Pantene Pro-V Classic Clean Shampoo, 900ml</p> 	<p>L'Oréal Paris Paradise Mascara Black, 6.4ml</p> 	<p>My Dog with Gourmet Beef and Roast Vegetable Flavour Dry Dog Food, 1.5kg</p> 
<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>	<p>Palm oil present: Yes / No Sustainable and Certified: Yes / No</p>

How many grocery items used sustainably sourced and certified palm oil? _____

Did this surprise you? Yes / No

HOUSEHOLD CHALLENGE (1)- Pantry Audit

Have you ever thought about whether your family consumes palm oil products? Check out your pantry now!



Complete the table below- take a tally!!!

PANTRY CATEGORY	Includes palm oil	Sustainably sourced/ certified	Does not include palm oil
Grains/pasta			
Dry ingredients (e.g., flour, sugar)			
Wet ingredients (e.g., oil, honey)			
Healthy snacks (e.g., nuts)			
Junk food (e.g., lollies, potato chips)			
Breakfast foods (e.g., cereal)			
Canned goods			
Spices			

Report your findings to your family- record their thoughts.



HOUSEHOLD CHALLENGE (2)- Cook a meal without palm oil

Design and cook a meal for your family.

This needs to be free of palm oil OR uses palm oil that has been sourced sustainably and certified.

Upload to MS Teams:

- ◇ A list of ingredients and method
- ◇ A photograph of the final product



PALM OIL FREE OR SUSTAINABILITY CERTIFIED PRODUCT SHOPPING GUIDE

Find palm oil free or sustainably certified products for the following grocery categories.

[Hint: Access Sustainable Table's *Palm Oil- the oily truth* pdf (pp.3-4) at: https://sustainabletable.org.au/wp-content/uploads/Palm_Oil.pdf]

SNACK FOOD	CEREALS	ICE CREAM	SAVOURY BISCUITS	SWEET BISCUITS
CHOCOLATE	SPREADS	CLEANING PRODUCTS	PERSONAL CARE	



THE CAMPAIGN

Since 2009, Zoos Victoria has been campaigning to get labelling laws changed in Australia so that palm oil is no longer hidden as 'vegetable oil' or any other names on the products you buy. So far, more than 470,000 Australians have spoken up for palm oil labelling through *Don't Palm Us Off* and you can too!

By having mandatory labelling of palm oil on products, this will put the power back into the hands of consumers who will have the choice to buy products containing certified sustainable palm oil.

This will put pressure on manufacturers to clean up their act and only source 100% Segregated and sustainable palm oil as certified by the independent governing body the Roundtable on Sustainable Palm Oil (RSPO).

Tell your Minister that you want palm oil to be clearly labelled.

Because you have the right to know where that palm oil came from.

Choose your state or territory to send a message to your minister:

ACT

New South Wales

Northern Territory

Queensland

South Australia

Tasmania

Victoria

Western Australia

OPTIONAL:

Message the NSW Minister to let them know that you want palm oil to be clearly labelled at:

<https://www.zoo.org.au/dont-palm-us-off>