

# **Climate Change**

**L.O: To explain the causes of climate change.**


# Success Criteria

- ▶ Understand what Climate Change is.
- ▶ Understand the processes which contribute to Climate Change.
- ▶ Discuss the possible impact of Climate Change on the survival of living things.

# What is Climate Change?

- **Climate Change** refers to changes in the world's **atmosphere**.
- It includes a rise in average global temperature and changes in rainfall, and other weather patterns.

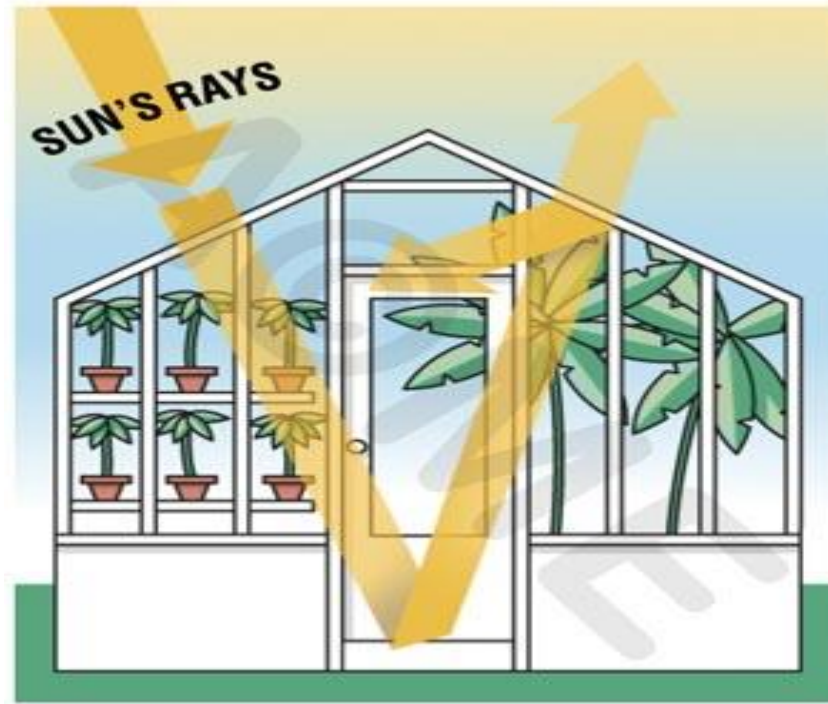


The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic look.

**What is causing Climate  
Change?**

# The Greenhouse Effect

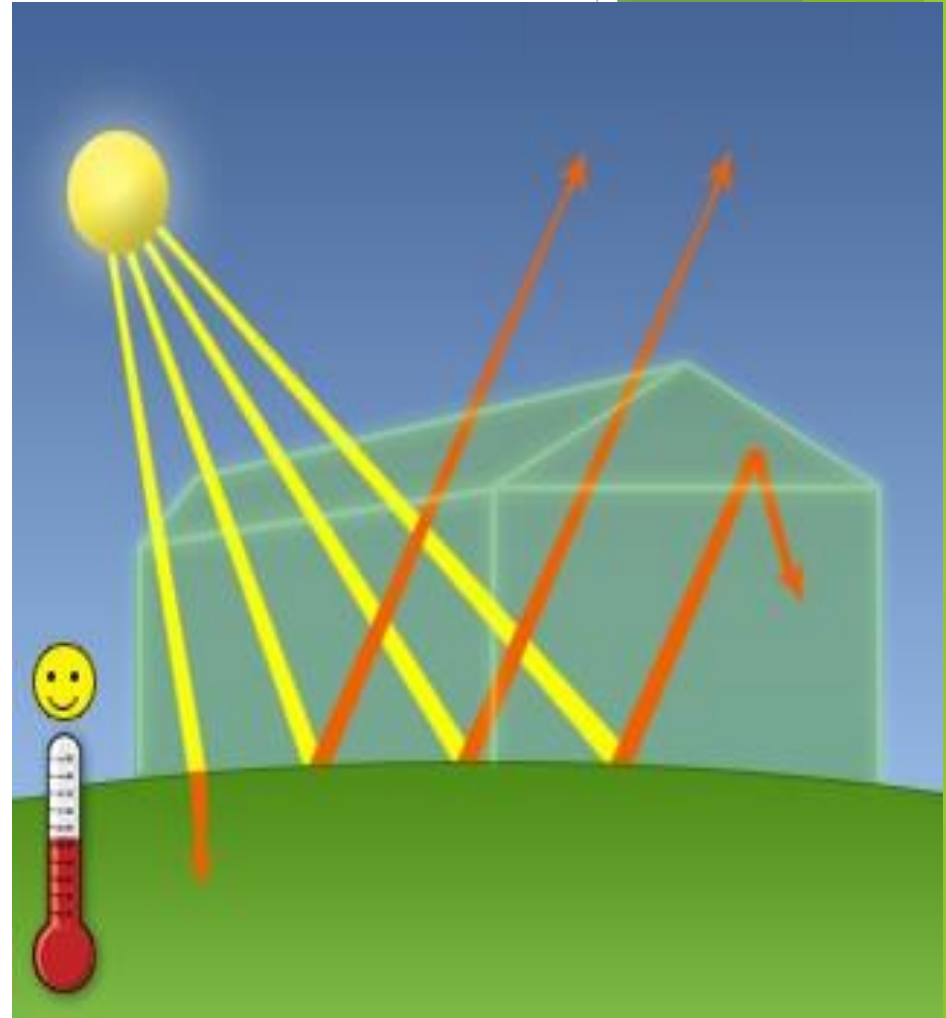
- At the heart of Climate Change is the **GREENHOUSE EFFECT**.



[effetdeserretoimeme.com](http://effetdeserretoimeme.com)

# Greenhouse Effect

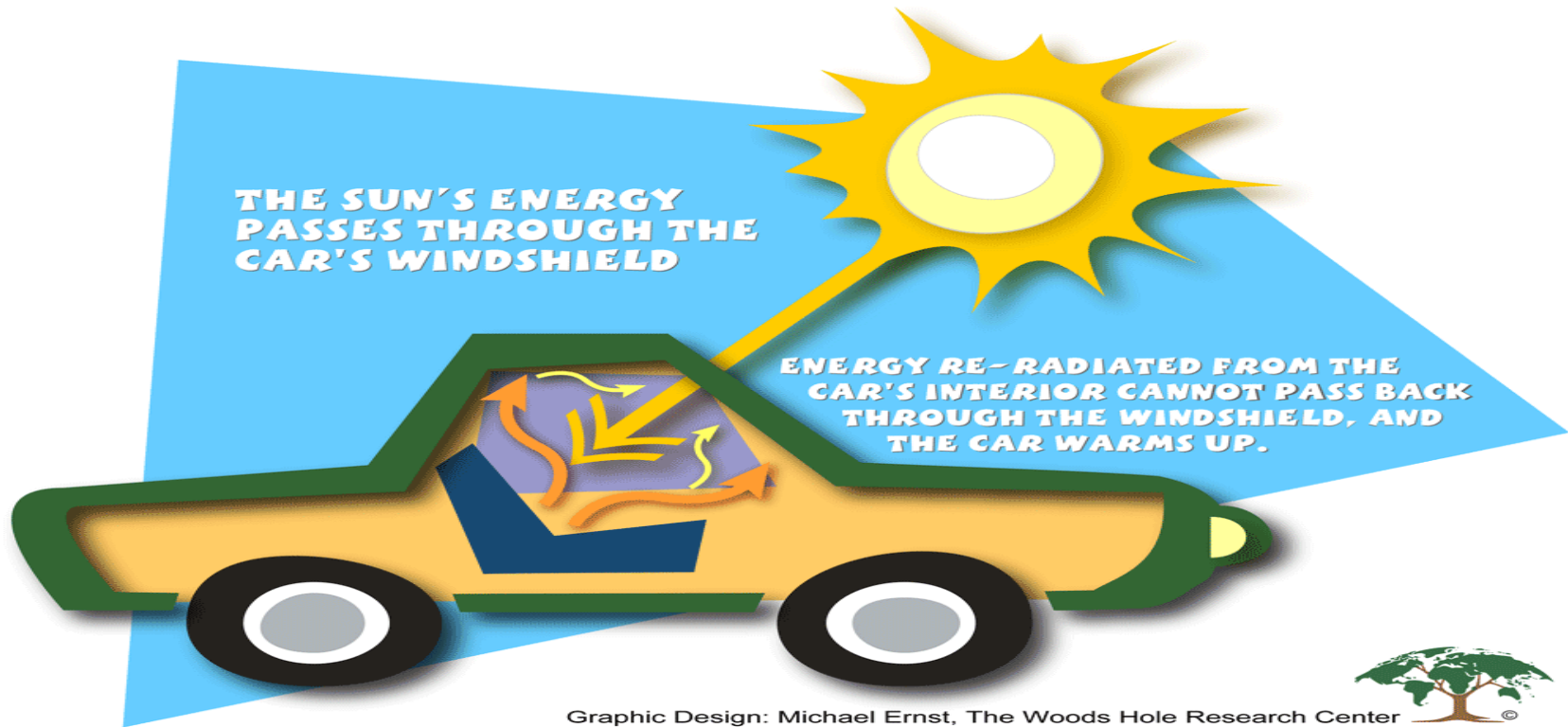
- Greenhouses trap heat from the sun.
- The glass panels let in light but keep heat from escaping.
- This causes the greenhouse to heat up.





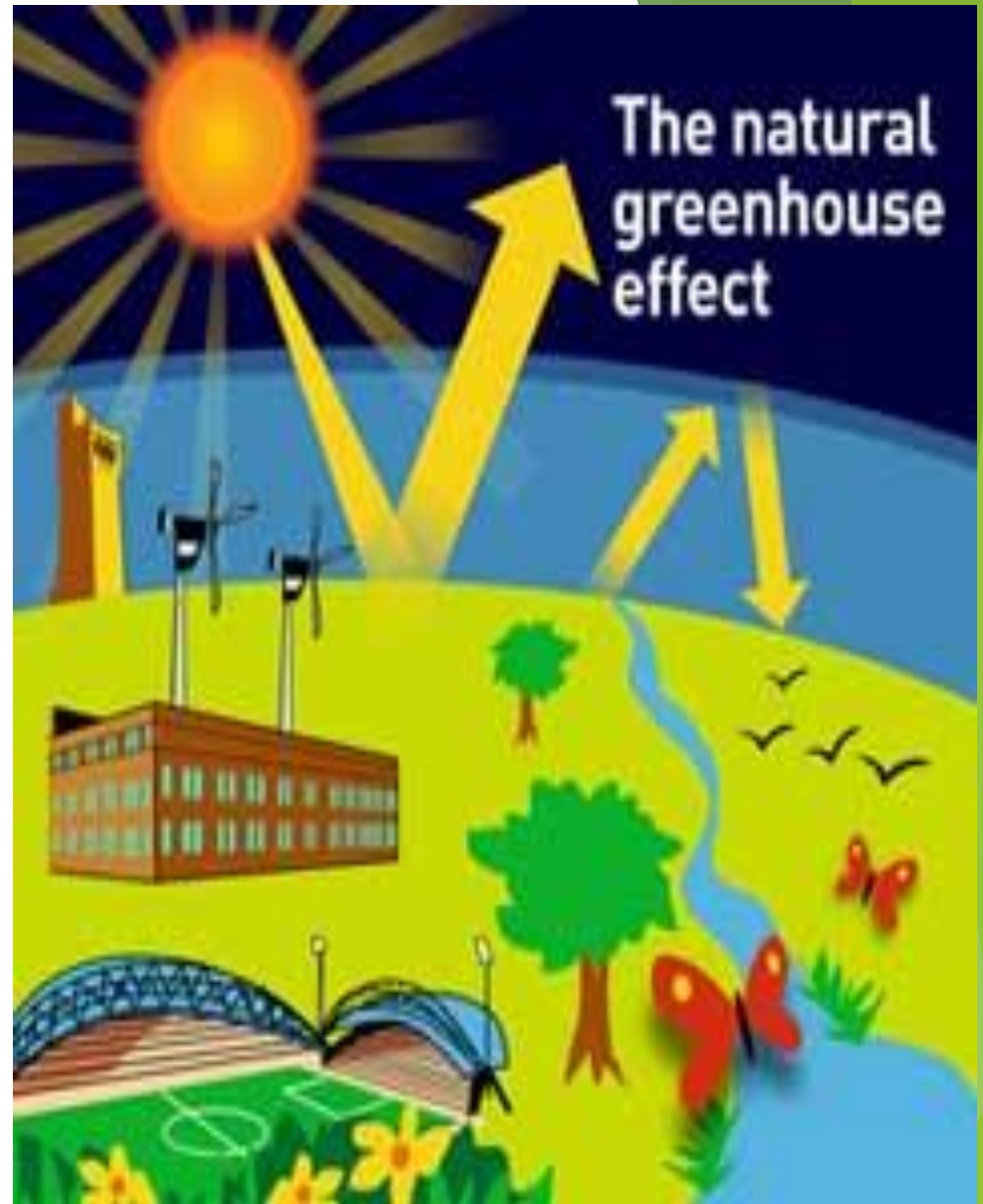
# Greenhouse Effect

- The same thing happens when a car is left in direct sunlight.



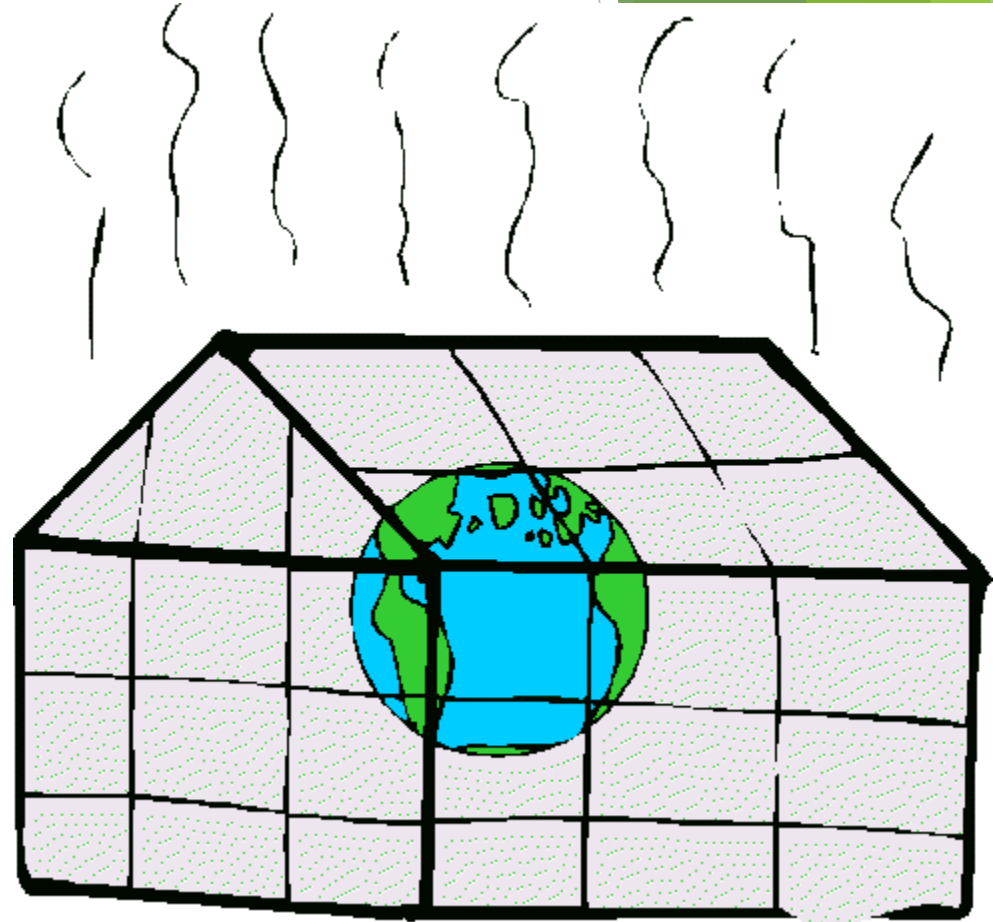


**On Earth, the atmospheric gases allow sunshine to pass through but absorb heat that is radiated (bounced) back from the warmed surface of the Earth**



# Greenhouse Effect

- The gases in the atmosphere act like a blanket around our planet which traps in heat, making the temperature rise.
- This is called the Greenhouse Effect and is a natural process that keeps the planet warm and sustains life.
- If the greenhouse effect didn't exist, the average temperature on earth would be around  $-18^{\circ}\text{C}$ .





Without  
greenhouse  
gases,  
heat would  
escape back into  
space and Earth's  
average  
temperature  
would be about  
 $16^{\circ}\text{C}$  colder...



...and the  
Earth would  
not be warm  
enough for  
humans to  
live.



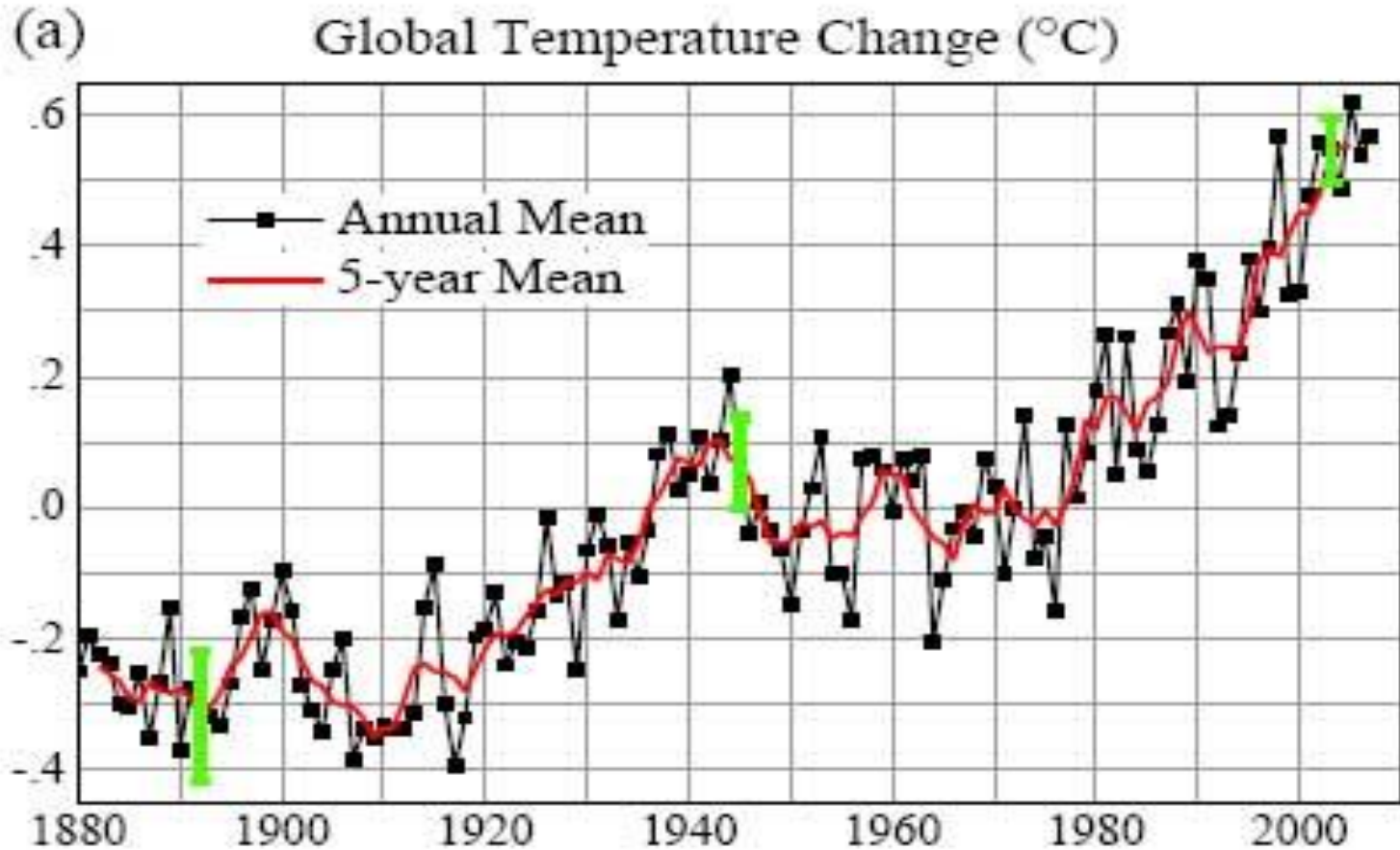
# Greenhouse Effect

So what's the problem?

- The increasing amounts of greenhouse gasses released into the atmosphere due to human activities such as burning fossil fuels and cutting down forests is trapping more heat so making the planet warmer than it should be. This results in **Global Warming**.



# Global warming!



newscientist.com

# Greenhouse gases

- There are six greenhouse gases and it is thought that carbon dioxide ( $\text{CO}_2$ ) is one of the most important greenhouse gas.

Water vapour  
( $\text{H}_2\text{O}$ )

Methane  
( $\text{CH}_4$ )

Ozone  
( $\text{O}_3$ )

Nitrogen  
dioxide  
( $\text{NO}_2$ )

Carbon  
dioxide  
( $\text{CO}_2$ )

Sulphur  
dioxide  
( $\text{SO}_2$ )





**BUT WHERE  
DO THESE  
GREENHOUSE  
GASES  
COME  
FROM???**

# GREENHOUSE GASES

Greenhouse gases can come from;

1. Natural sources
2. Man-Made sources

# Natural Climate Change

Greenhouse gases occur naturally and cause the climate to change in a normal, natural way. Lets look at 4 of them.

Methane  
(CH<sub>4</sub>)

Nitrogen  
dioxide  
(NO<sub>2</sub>)

Carbon  
dioxide  
(CO<sub>2</sub>)

Sulphur  
dioxide  
(SO<sub>2</sub>)

# Carbon Dioxide Occurs Naturally

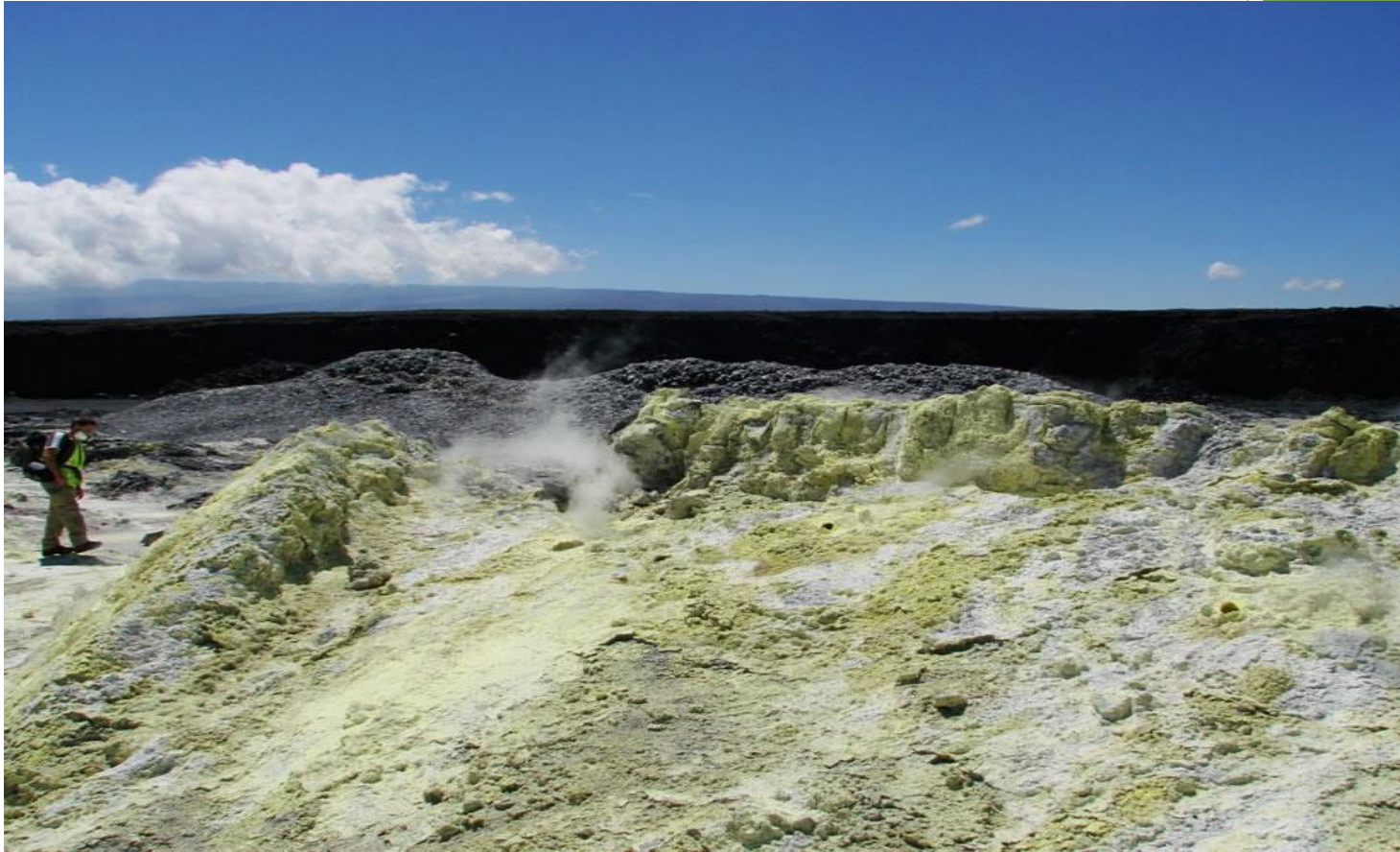


wondertime.go.com

**Produced by living organisms through respiration (breathing).**



# Sulphur Dioxide Occurs Naturally



geology.com

**Released from volcanoes**

# Methane Occurs Naturally



[michellehenry.fr](http://michellehenry.fr)

**Decomposition of organic matter including rotting fruit and vegetables (especially in wetlands).**



# Nitrous Oxide Occurs Naturally



123rf.com

From  
bacteria  
in soil.



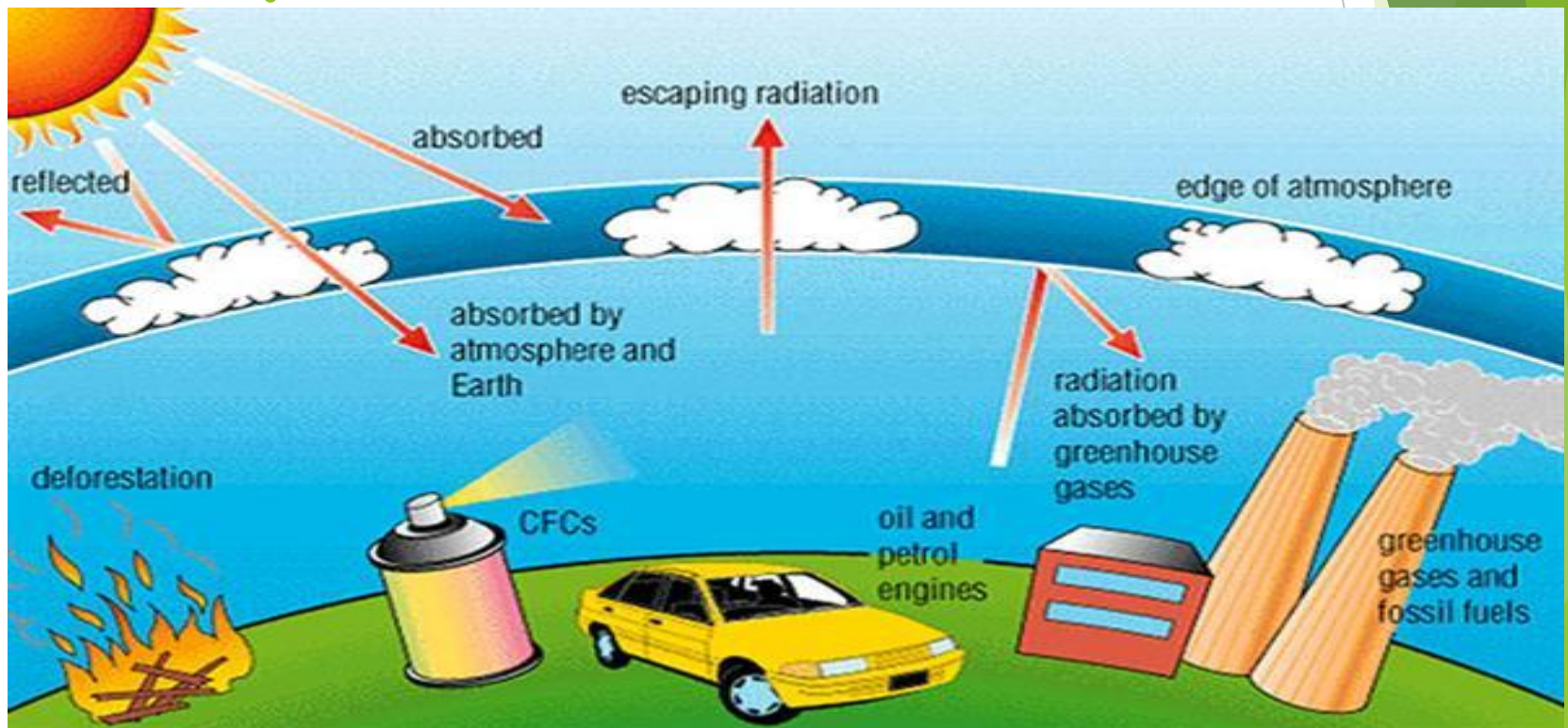
fnal.gov

During  
lightning  
storms.



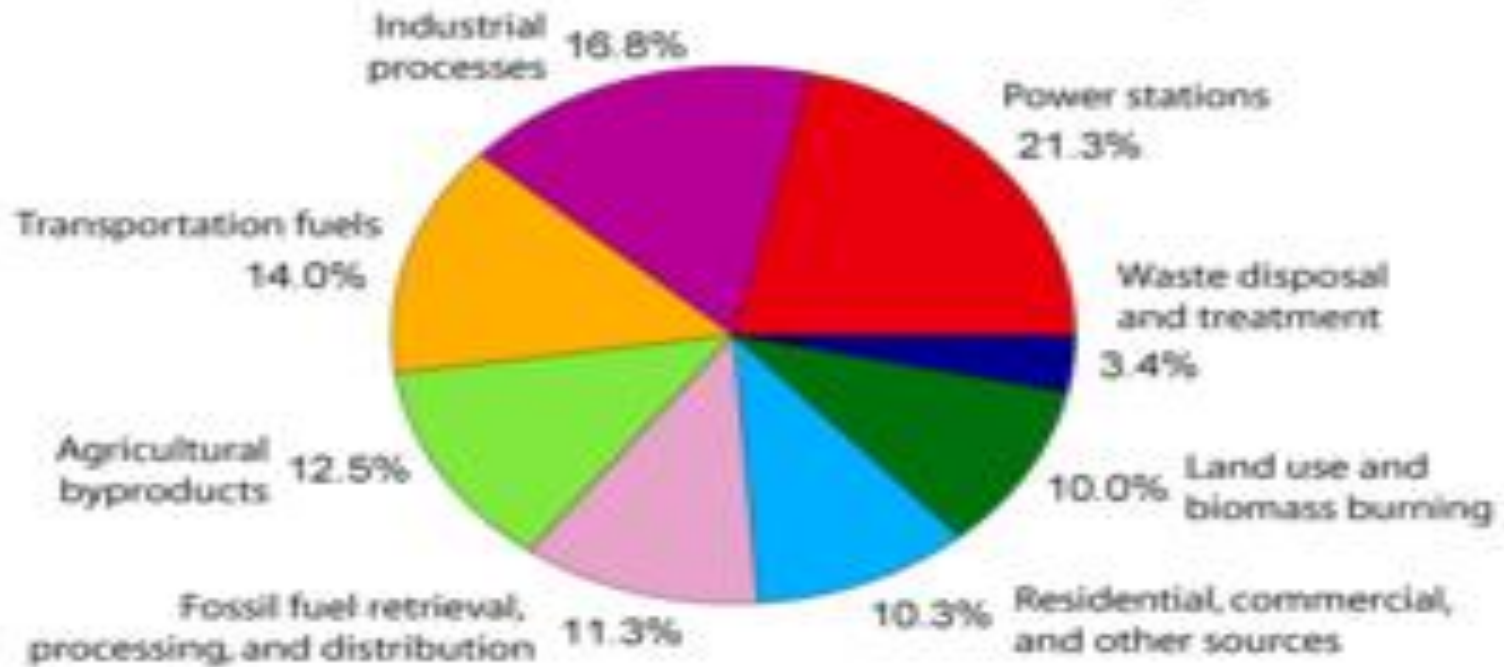
# Man-made Climate Change

Man has increased the amount of Greenhouse gases going into the atmosphere.



# Man-made sources of extra Greenhouse gases

**Annual Greenhouse Gas Emissions by Sector**



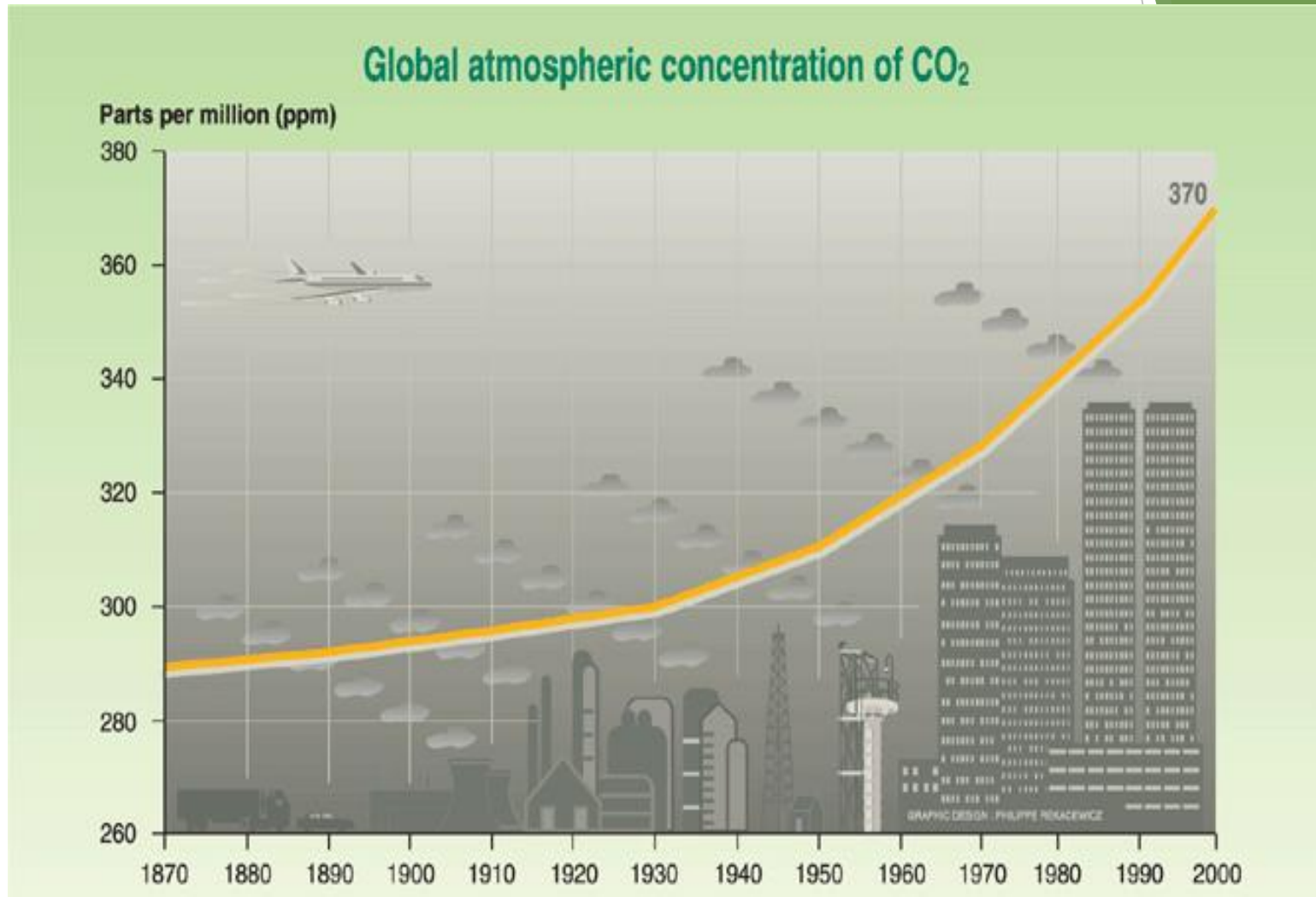
# Man-made Sources of Carbon Dioxide



[globalwarmingimages.net](http://globalwarmingimages.net)

**Burning of solid waste, wood, and fossil fuels to fuel transport and machines (oil, natural gas, and coal).**

# Carbon dioxide concentrations have been on the rise since the industrial revolution





# Man-made sources of Sulphur dioxide



A lump of coal might look like it only contains carbon, but there is an impurity hidden in within it.

Sulphur is found in most fossil fuels and is a problem when it burns it forms sulphur dioxide.



# Man-made Sources of Nitrous Oxide

Agricultural and industrial processes



# Man-made Sources of Nitrous Oxide

Car Engines



The spark plug in the car engine causes the nitrogen and oxygen in the air to react together.



# Man made sources of Methane

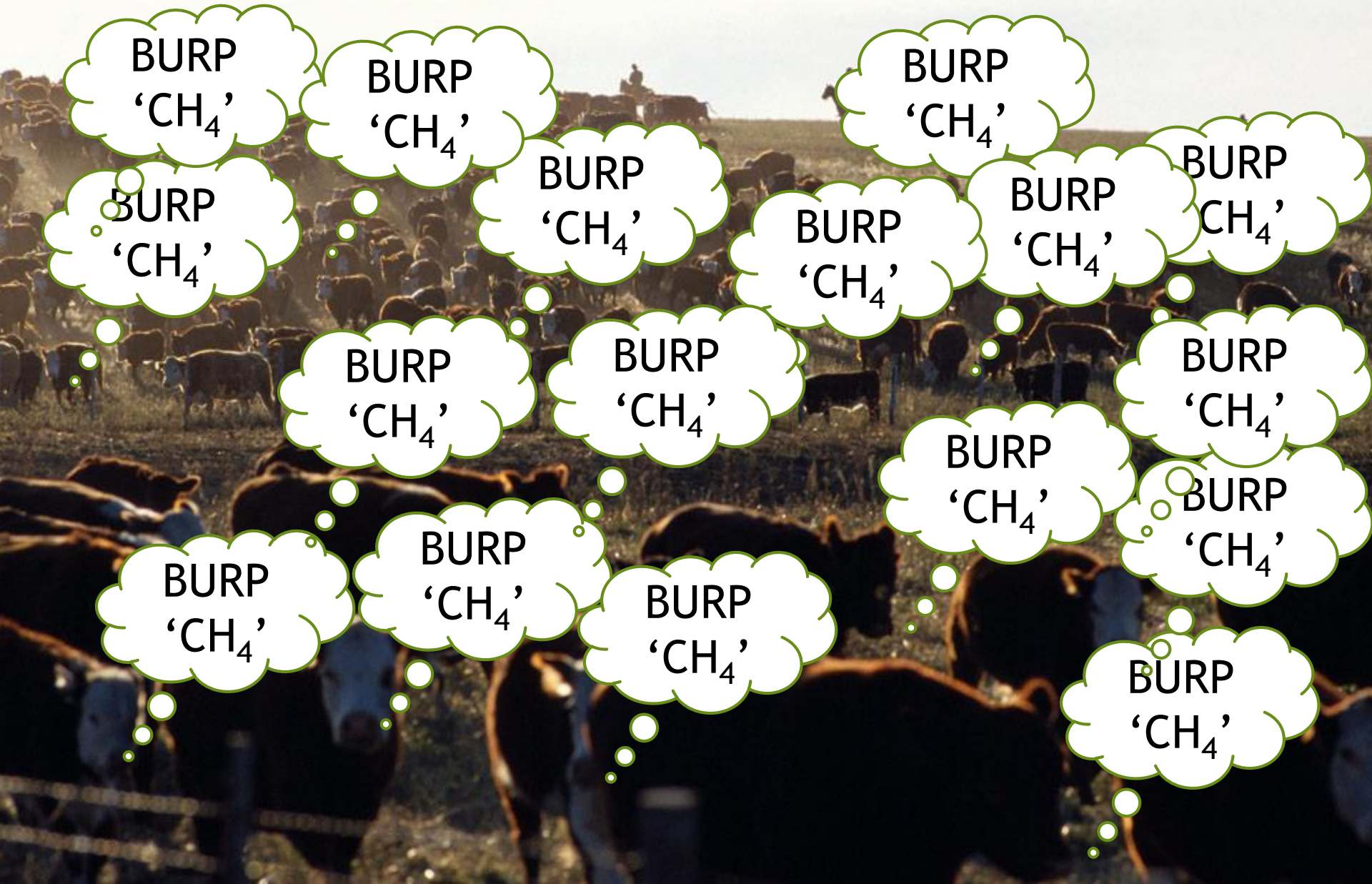
Humans are eating more and more meat.

In order to meet the demand, farmers are having to rear more and more cattle.

Cows are one of the main natural contributors of methane but as man is breeding more and more cows humans are inadvertently creating more methane.

This is one of the main reasons for scientists trying to promote plant based diets to reduce the number of animals we have on the Earth.

# Man-made Sources of Methane



BURP  
'CH<sub>4</sub>'

BURP  
'CH<sub>4</sub>'

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# **Climate Change**

**L.O: To discuss the  
consequences of climate  
change**



freakyweather.com

Even a little  
greenhouse  
extra  
warming  
becomes  
stronger, it  
may cause  
problems  
for humans,  
plants, and  
animals.



# What if the Earth heats up?

Sea levels around the world could rise.  
Cities on coasts could flood.



[lilithnews.com](http://lilithnews.com)



[sinostand.com](http://sinostand.com)

# What if the Earth heats up?

Temperate places that now receive less rain and snowfall might become hotter and drier, leading to more **drought**.





# What if the Earth heats up?

Frequent periods of drought would make it hard to raise crops for food, leading to **famine**.



[photoshelter.com](http://photoshelter.com)



[jamblichus.wordpress.com](http://jamblichus.wordpress.com)



# What if the Earth heats up?

Forest fires could occur more often.



[blogs.canoe.ca](http://blogs.canoe.ca)

# What if the Earth heats up?

Plants and animals unable to take the heat may go extinct, and be replaced by heat tolerant species.



[neutralexistence.com](http://neutralexistence.com)



[saddleridgeva.com](http://saddleridgeva.com)



# What if the Earth heats up?

Hurricanes, tornadoes and other storms caused by changes in heat and water evaporation might occur more frequently and be more intense.



[pantherfile.uwm.edu](http://pantherfile.uwm.edu)



[ownthedollar.com](http://ownthedollar.com)

# The effects of Climate Change

In the UK, we expect that because of climate change:

- Temperatures will increase.
- Winter rainfall will get heavier, increasing the risk of flooding.





# The effects of Climate Change

- Summer rainfall in the UK may reduce considerably, creating pressure on water resources.



- Sea levels will rise due to melting ice caps, leading to further coastal erosion and flood risk.

