Climate change and Global Warming

https://visme.co/blog/climate-change-facts/

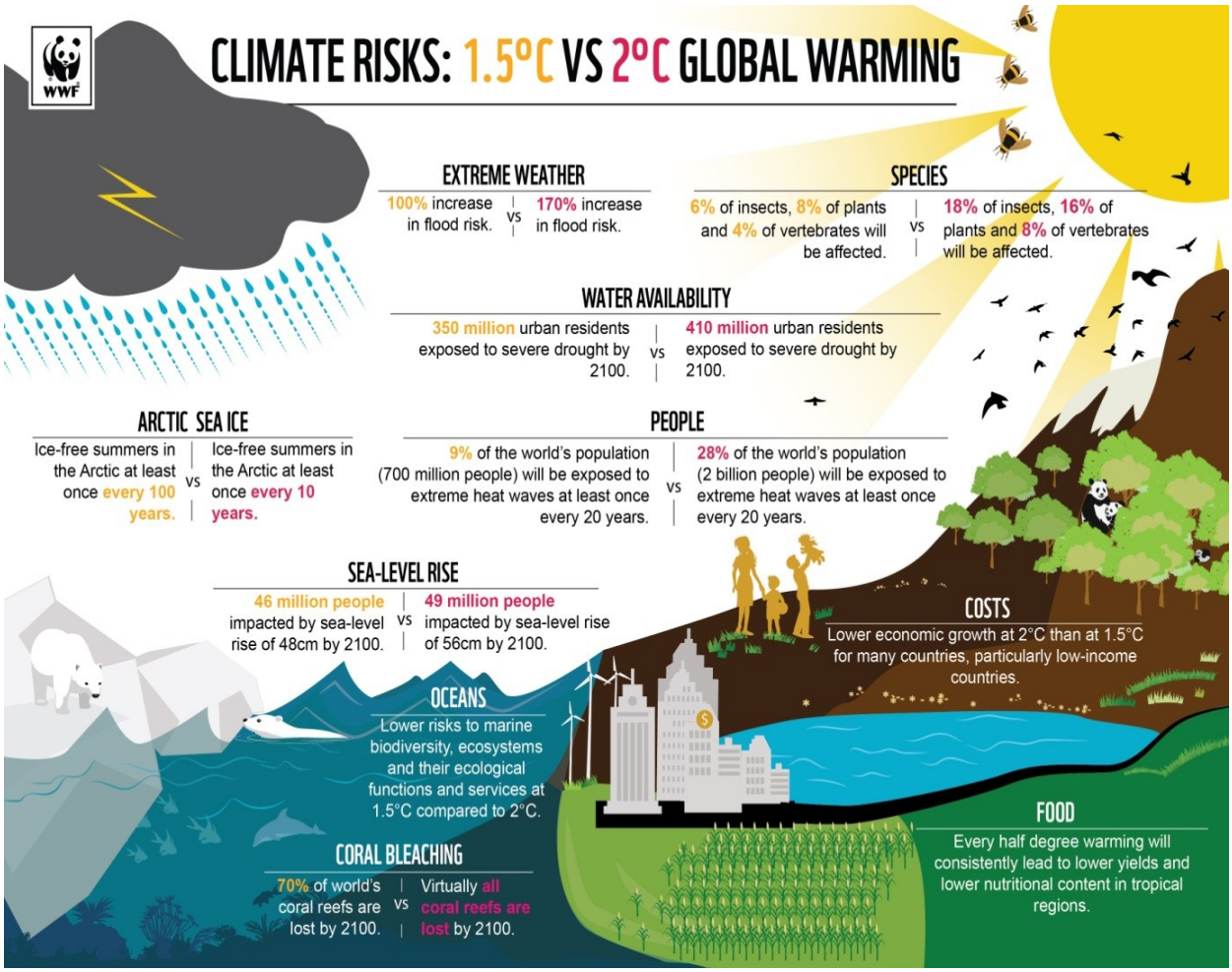
Climate change is a controversial topic. Many people and countries have different views. So understanding the science is very important.

Scientists warn that if no action is taken and global warming increases by more than 2°C then climate risks and global changes will be catastrophic.

The Paris agreement refers to many countries across the world agreeing to take appropriate steps to slow down the increasing rate of global warming.

Climate Risks

- Extreme weather – heat waves, flooding, hurricanes etc
- Rise in Temperature anomalies
- Greater loss of species – polar bear, penguin
- Movement of other species northwards ie. Insects
- More of the world experiences drought as water availability changes
- Arctic sea ice is shrinking
- Antarctic continent ice melting
- Permafrost also melting and releasing stored gases
- More people across world experience severe heat waves
- Sea level rises impact on coastal and low lying areas ie Netherlands, Bangladesh
- Acidification and changes in Oceans cause risk to marine ecosystems and all life
- Coral reefs are lost (bleaching)
- Human costs - lower economic growth & lower crop yields
- Fast growing cities in Africa could face worse climate risks
- Malaria will impact on northern areas
- Increase in skin cancers



Source - World wildlife Fund infographics

Web results

https://www.wwf.org.uk/updates/our-warming-world-how-much-difference-will-half-degree-really-make

Video links

Our warming world: How much difference will half-a-degree ...

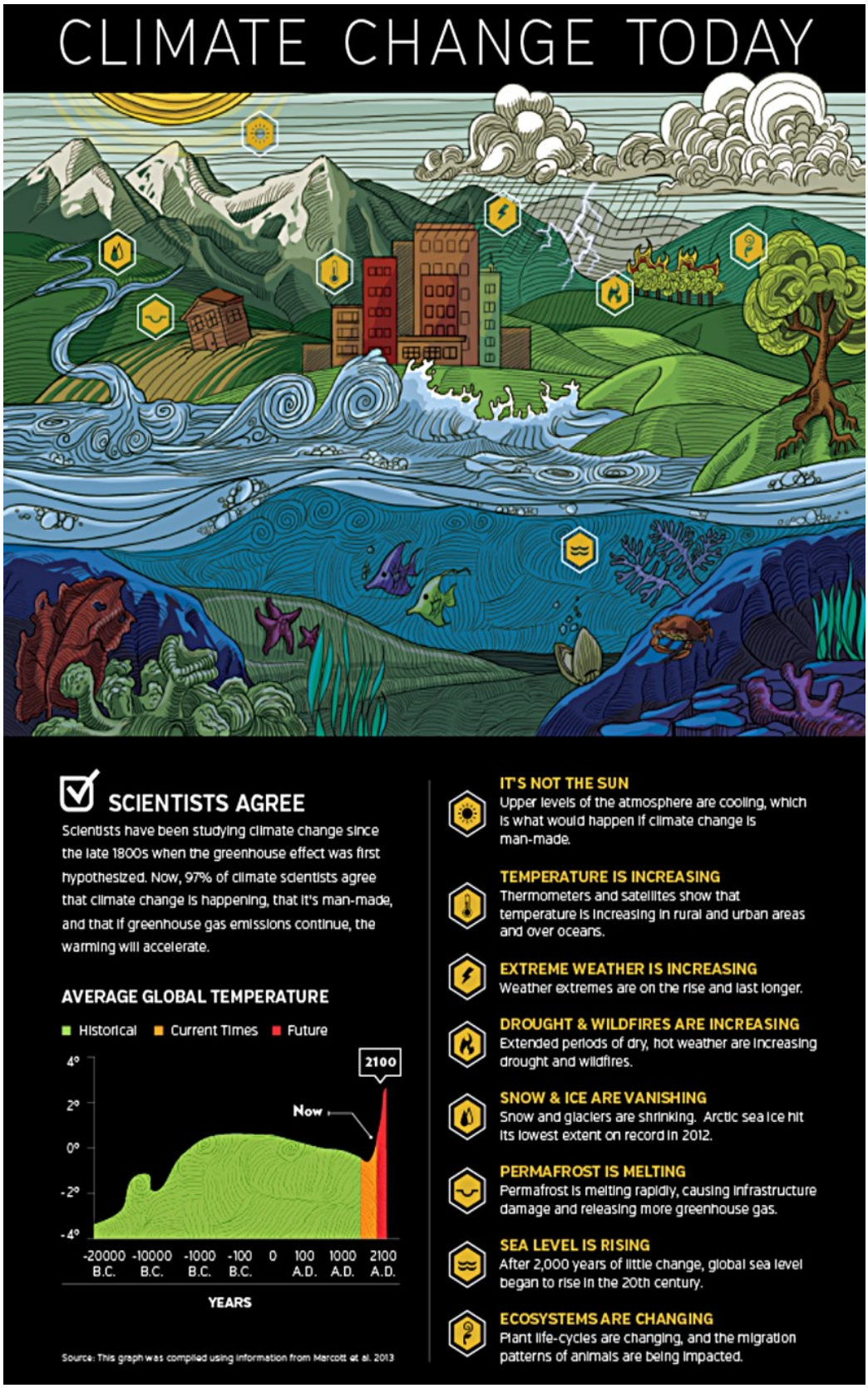
More interesting infographics found here

The Best Visualizations on Climate Change Facts | Visual ...

https://visme.co › blog › climate-change-facts

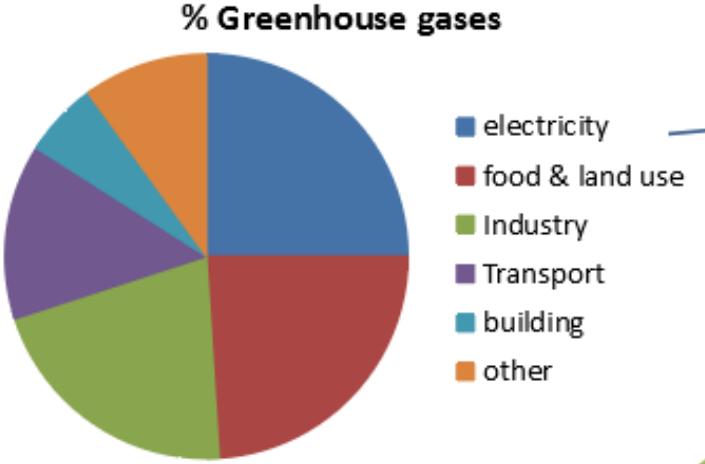
Infographic **created by weather underground in 2013** - data published by [Marcott *et al* in Science Magazine](#)..

Infographic - A visual representation of key factors regarding climate change and global warming

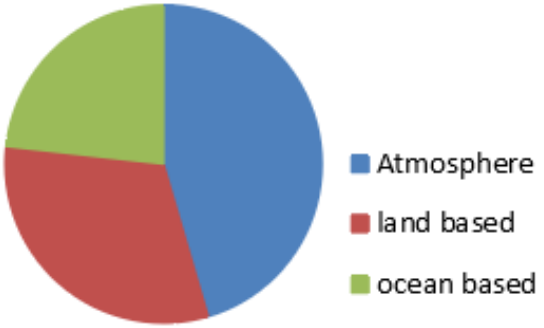


Carbon dioxide

Most CO2 is produced from fossil fuels (62%) and land use (23%)

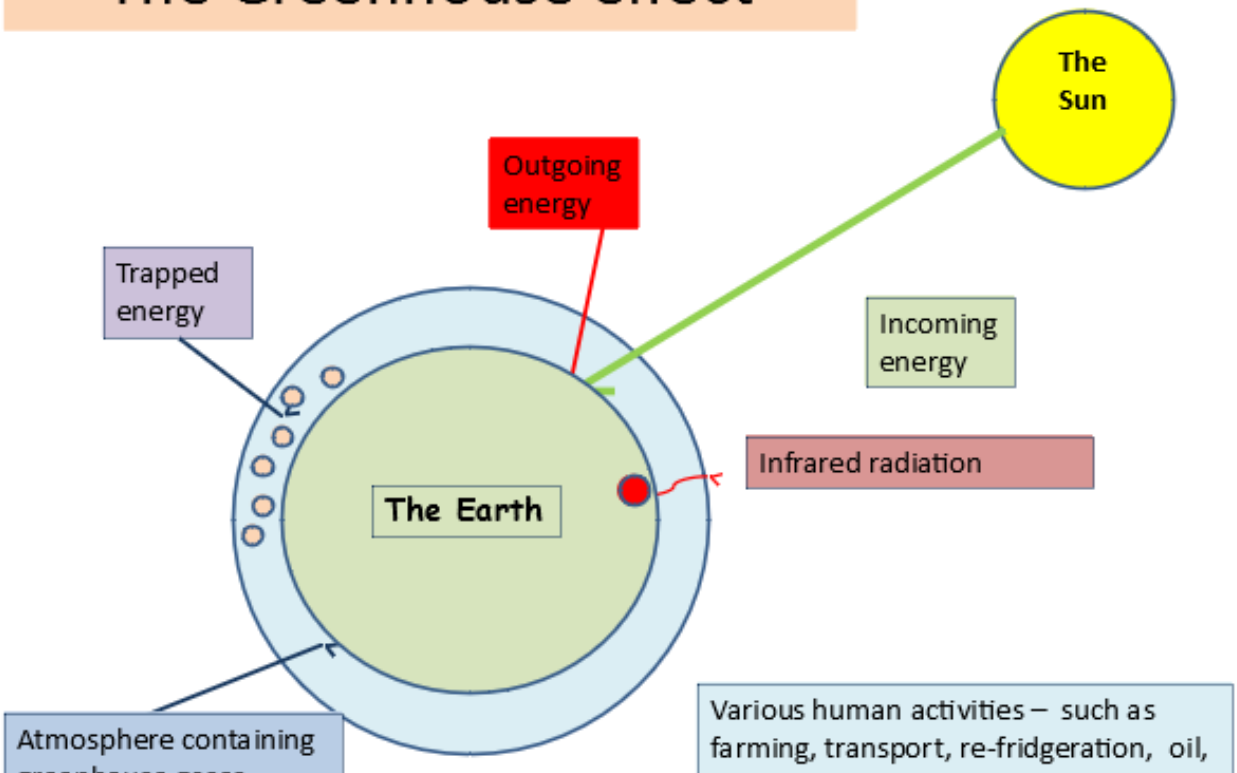


The Human sources of greenhouse gases



CO2 is then dispersed into atmosphere or stored in the land and ocean (sinks)

The Greenhouse effect



Climate Change is Here!

Part 1

Scientists researching the oceans have confirmed that global warming is not a result of natural factors. They say that there is clear evidence that human activity has had a direct impact on warming in the oceans. They warn that this will in turn lead to the warming up of the atmosphere and pose problems of water availability in many regions across the Earth. For years people have been uncertain about the causes of global warming. In fact, sceptics and some world leaders have chosen to 'bury their heads in the sand', preferring to believe that global warming is a natural phenomenon caused by volcanic activity and solar energy. Many countries have continued to rely on environmentally unfriendly economic activities such as coal mining, oil and heavy duty vehicles. They have been slow to react to limiting their carbon emissions and developing their renewable energy capacity.

Part 1 – tops and tails

Scientists researching the oceans have confirmed	about the causes of global warming
For years people have been uncertain	unfriendly economic activities such as coal mining, oil and heavy duty vehicles
They say that there is clear evidence that human activity	has had a direct impact on warming in the oceans.
Many countries have continued to rely on environmentally	that global warming is not a result of natural factors.

Questions & Idioms

What will cause problems for water availability in many regions across the earth?

Who bury their heads in the sand? Why?

Who have been slow to develop their renewable energy capacity? Why?

' Bury their heads in the sand' is an idiom. What does it actually mean?

Can you think of any other idioms? Give an example and explain what it means.

Part 2

Fill in the gaps

In 2005 (Kyoto protocol) industrialised _____ agreed to reduce greenhouse gases by adopting _____to mitigate (reduce) the causes ie. CO2 emissions. However commitment remained _____. In recent years experts have warned that climate _____ is moving at a faster rate as reflected in data collected for surface temperature, sea level rises. ice _____ melt, ocean acidification and extreme _____ events. The Paris agreement 016 saw a more positive shift as 196 countries agreed to set a new limit to keep temperature _____ well within 2°C. Poor countries had been given more say and support while _____ countries agreed to contribute more.

Many experts believe that some features of climate change have gone too far and may be irreversible with huge implications for _____ of people. Working together in a global _____ is now more important than ever, continuing to reduce the causes and develop strategies that _____ us to adapt and manage our changing environments.

strategies millions rich countries increase change inconsistent sheet community weather enable

Text Activities

- **Read the text 'Climate Change is Here!'**
- **Identify new vocabulary**
- **Do you know other global warming words?**
- **Have you experienced severe weather?**
- **What are the Kyoto Protocol and the Paris Agreement?**

True and False

- Global warming is caused by human activity, not natural environmental factors. T / F
- Clear evidence of human-produced warming is in the world's rivers. T / F
- Global warming is not likely to impact water resources around the globe. T / F
- Many world leaders have chosen to believe the scientists about global warming. T / F
- There has been great commitment to limiting carbon emissions. T / F
- Global warming is a natural phenomenon, caused by volcanoes and solar energy. T / F
- Many experts believe that climate change is reversible. T / F
- Many world regions will be at risk of having poor water availability T / F

Matching words and phrases

direct impact	availability
natural	for millions of people
serious	emissions
problems for water	in the sands
world leaders have buried their heads	evidence
limit carbon	on warming in the oceans
there is clear	consequences
huge implications	energy capacity
renewable	phenomenon

confirmed
rely
pose
react
mitigate
adapt

•
•
•
•
•
•

Your verbs and adjectives

extreme
natural
faster
changing
clear
global

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•
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•
•
•

Climate Change- Matching Activity

Word	Meaning
a. climate change	1 a rise in temperature of the earth caused by polluting gases e.g. carbon dioxide
b. global warming	2 keep and protect from loss or waste
c. emissions	3 a difficult time in a country when there is less business activity than usual
d. carbon footprint	4 the way the world's weather is changing
e. developing countries	5 the amount of gas, heat, light. pollution etc that is sent into the air
f. recession	6 a measurement of how much carbon dioxide people produce
g. conserve	7 thinking that bad things are going to happen
h. pessimistic	8 places where there is ittle industrial and economic activity and where people do not earn much money.

Thoughts & feelings

☺ ☹

Weather likes / dislikes

Conserve / waste

Optimistic or pessimistic

Environmental awareness

Earth friendly attitude / behaviour

Recycling – reduce –re-use (3R's)

Carbon footprint

Negatives / Positives

Electricity

Transport (car)

Home

Clothes

Holiday travel

Energy resources

Impact of Global warming – rising sea levels, melting ice

Discussion

Weather in the past	Weather now	Weather in the future

Write a letter or email to .....

Friend
Teacher
Member of Parliament
Company director
Journalist
Scientist
World Leader

Carbon Footprint

Every action has a price, that comes in the form of natural resources (money) withdrawn from the Earth (bank)

Carbon footprint is the total amount of greenhouse gases released into the atmosphere that are produced to support human activity (directly or indirectly)
Eg. burning fossil fuels, vehicles, power plants, factories, food production .

A Typical day

- Drive to work
- Do laundry
- Watch TV
- Take a shower
- Heat / cool your home
- Drive to the supermarket
- Use the computer
- Print some information
- Prepare food

Your footprint is based on what you do according to your lifestyle (actions and preferences)

Carbon footprint in tonnes CO2
Average UK person = 10
Average UK household = 26
Climate change ideal score = 3
UK is 36th in world

https://footprint.wwf.org.uk/#/

What can we/you do to reduce our /your carbon footprint ?

Small steps:

Leave car at home
Take short showers
Turn heating thermostat down
Fewer shopping trips
Eat less meat
Shop responsibly
Grow your own/plant a tree
Don't waste paper
Reduce carbon footprint
https://footprint.wwf.org.uk/#/

https://en.reset.org/blog
12 things to know

Large steps:

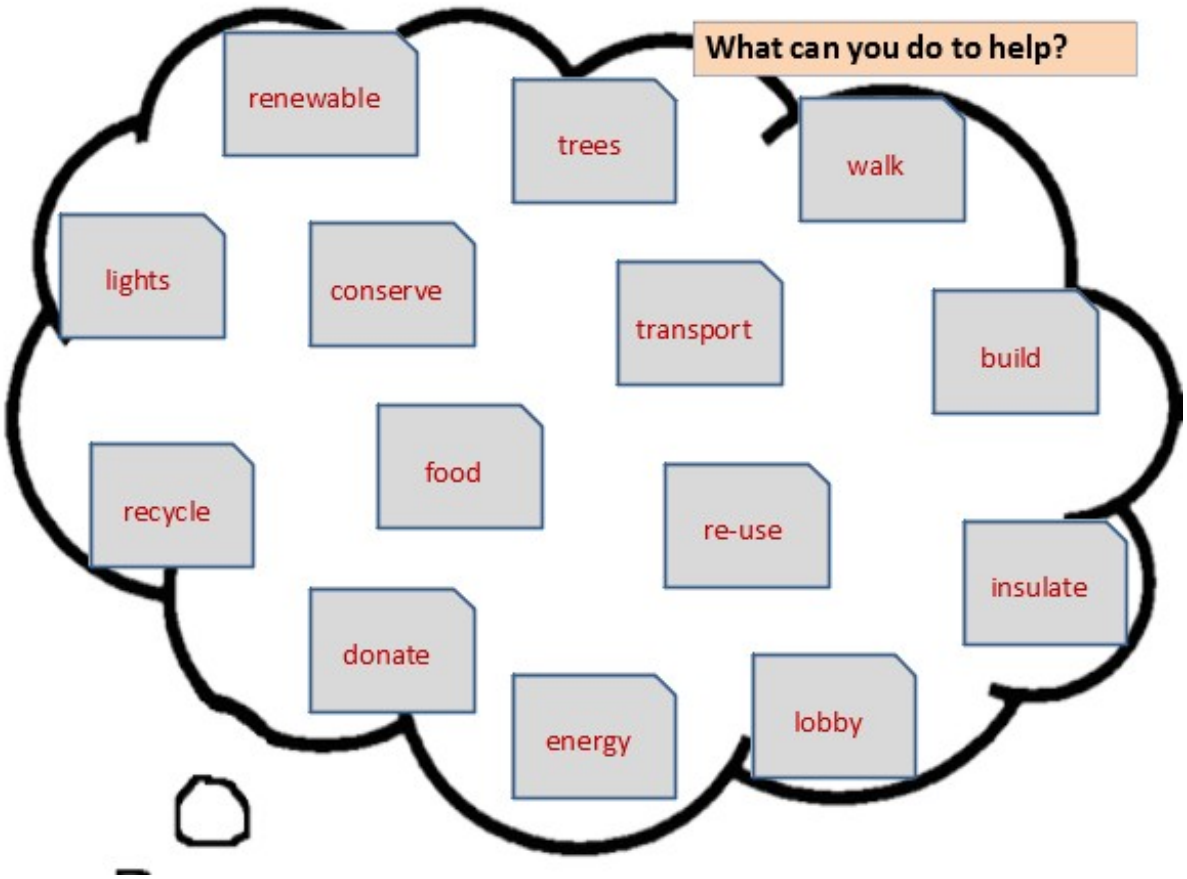
Renewable energy resources instead of fossil fuels
Solar panels - every new build
Encourage governments to be more society focussed
Work with other nations – share responsibility
Build climate resilience
Be positive – communities can adapt to change with support
Governments to lead by example
Promote sustainable goods

Carbon Footprint Chart 1

Travel		lbs			lbs
How often do you travel on public transport	Every day most days twice a week once a week Never	30 20 10 5 0	how often by car	Every day most days twice a week once a week never	120 80 40 20 0
How often by walking cycling or similar	mostly sometimes not often	0 5 10	How often do you share a car (work)	Every day most days twice a week once a week never	60 40 20 10 0
how many hours spent flying	100+ 25 10 3 0	100 50 25 1 0	Do you have Electricity at home? yes / no / green	yes green No	80 40 0
Food					
How much of your food is packaged ,processed or imported	Most ¾ ½ ¼ hardly any	40 30 15 8 2	How much of your food is dairy?	Most ¾ ½ ¼ hardly any	50 42 25 12 3
Do you eat mostly: vegetables & fruits meat bread rice pasta potatoes		 10 60 30	Do you eat mostly: fast food home cooked food half & half		 500 70 280

Carbon Footprint Chart 2

Energy use		lbs	Take shorter showers	Yes no	20 40
When you leave a room do you turn off lights	yes no	15 30	Do you turn off your computer/ games?	yes no	3 10
When you finish do you unplug appliances / chargers	yes no	2 4	Do you turn off the TV?	yes no	8 18
How do you dry your clothes?	hang up drier both	0 80 40	Do you turn off running water when you clean your teeth?	yes no	5 30
Do you wash clothes at lower temperatures? (30)	yes no	40 80	Do you lower heating and wear warmer clothes	yes No	100 200
Recycling		lbs			
Do you recycle?	yes no	0 10	Do you recycle garden waste?	no yes no garden	10 -20 0
What do you recycle?	glass alum/steel plastic magazines newspapers	-2 -10 -3 -2 -10	What other things do you recycle	clothes furniture household items electrical	-10 -15 -8 -5 -3
Total					



Discussion cards

1. Are you optimistic or pessimistic about the future of our climate? Give you reasons	2. Renewable energy resources are important. What are they? Why are they important?	3. 'Climate change is a global threat and requires global action.' Do you agree ? Why?
4. What are we / you doing to fight climate change? What & why?	5. What do you know about 'Carbon Footprint'? Can you reduce it?	6. What industries need to become cleaner & greener? Why?
7.Should all nations make the same contributions to reducing climate change? Discuss	8. Have you heard the phrase ' reduce carbon emissions'. What does it mean?	9. Are nations doing enough to slow down climate change? What has been done?
10. Experts warn that sea levels could rise 80cm by 2100. What would happen to our planet.? Discuss	11. Do you know what fossil fuels are? Why are they still used by many countries?	12. Recent changes in climate and weather are a result of natural or human causes? What do you think?

The challenges of climate change

What steps can we take to cope with the risks and build our resilience?

Take steps to reduce (mitigate) gas emissions that cause climate change:

- ✓Sustainable transport
- ✓Clean / renewable energy
- ✓Energy efficiency
- ✓Afforestation

Take steps to manage and adapt to the risks of climate change:

- ✓Flood protection
- ✓Infrastructure improvements
- ✓Effective business practice
- ✓Vulnerability & Crises

Take steps to build continuity, capacity and change:

Education and Research
Resource management
(water, forests, food, energy)
Alternative energy systems
People and communities

Full image of infographics on climate change

Additional slides for Climate Change

- Agreements between Nations
- Over to you
- Phrases and statements
- Human activity and land use

Climate Change Agreements

2005 United nations framework convention on climate change
Industrialised countries agree to reduce their greenhouse gas emissions according to their own specific circumstances - **The Kyoto Protocol**

2009 Copenhagan (COP 15)
Agreements were waivering – Conference seen as failure - Many people very concerned
Climate change already moving beyond patterns of natural variability
Parameters observed as moving toward irreversible states – surface temperatures, sea level rise, ice sheet melt, ocean dynamics and acidification, and extreme weather events

2016 The Paris Agreement
Set a crucial framework to limit global warming to well within 2 degrees C
A diplomatic consensus achieved between the 196 nations. Compromises made so that more say and support for poorer countries / Richer countries contributing more.
Kumi Naidoo (Green peace) described this as one step on a long road.

2019 COP(26) recent European climate change conference -Copenhagen. Extended into 2020
Giving UN and Governments more time to improve national plans, work together and strengthen their commitments to the climate crisis. There has been a shift towards
Lack of Action--- is not an option

2020 New European state of the climate Report - available to download. The report provides an overview of the record heat waves and extreme weather we experienced in Europe 2019.

Phrases and Statements

Strengthen commitments	Long term gains
Positive or negative impacts	Short term costs
Tipping points	Economic impacts
Increased risk	Enabling the shift
Meet the challenge	Groups with vested interests
Differential effects	Lobby the governments
Failure is unthinkable	Ineffective governance
Rapid, sustained, and effective steps	Weak institutions
Climate resilience	Innovative leadership
Coordinated global action	'Up their game'
Decarbonise economies	Vulnerable groups
Climate change mitigation strategies	Climate safety net
Minimising the impacts	Social disruption
Climate Change adaption strategies	Fabric of society
Sustainability	Social fairness

Climate Change – over to you

- The international community has been working to mitigate the causes of global warming ie. limit CO_2 emissions.

Q **Is this working?**

- Recently they have been diversifying their efforts by promoting adaption strategies that help to minimise the negative effects of global warming ie, flood defenses, developing drought resistant crops.

Q **What are you thoughts?**

- The belief is that these mitigation and adaption strategies will compliment each other to build climate resilience and lessen the impacts of climate change.

Q **Do you agree?**

- The challenges presented by the varying strategies will be different – but the goal is the same.

Q **Are humans doing enough?**

Q **What can you do ? (at home / locally)**

Quotes by David Attenborough

1 "There is no question that climate change is happening; the only arguable point is what part humans are playing in it."

2 "It is that range of biodiversity that we must care for – the whole thing – rather than just one or two stars."

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Footprint

The Earth's ability to produce

- natural resources
- land for humans to build on
- absorb waste ie. Carbon emissions

Human activity + Use of land/sea

Carbon uptake footprint which is the amount of forest land required to absorb co2 emissions released from burning fossil fuels, land use and chemical processes.

Grazing footprint –area used to raise livestock for meat, dairy, hide and wool

Forest footprint - calculated from amount of lumber, pulp, timber, and fuel consumed

Fishing footprint – primary production used to support fish and seafood caught

Cropland footprint - area used to produce crops for food and fibre, feed for livestock , oil crops and rubber.

Built up land footprint - area covered by human infrastructure ie transport, housing, industry, reservoirs, hydro electric etc.