

Carbon cycle Terminology Recap



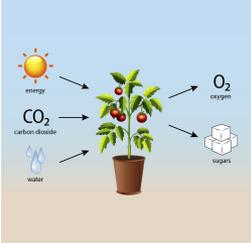
Fossil fuels: coal (and gas and oil)



Combustion: When things burn

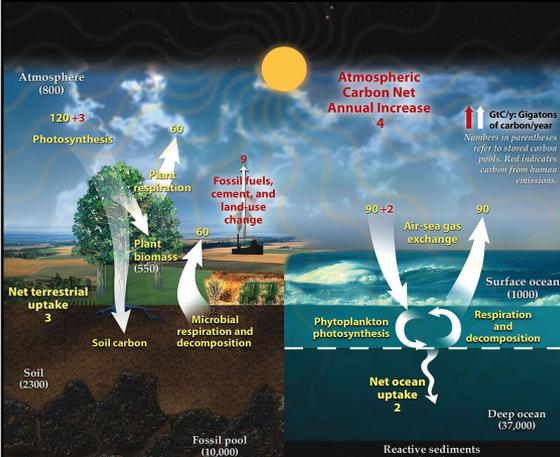


Cellular respiration (humans)



Photosynthesis (plants)

Carbon cycle Annual flux



Fast carbon cycle showing the movement of carbon between land, atmosphere, and oceans in billions of tons of carbon (gigatons of Gt) per year.

Yellow numbers are natural fluxes, red are human contributions, white are stored carbon.

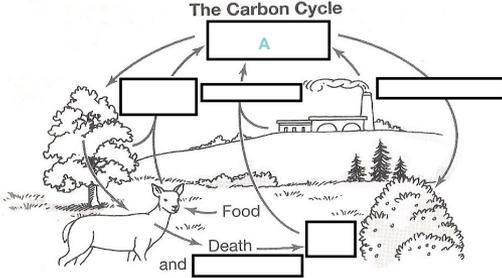
Note: Human caused emissions seem deceptively small on the scale of the global C but the atmosphere is a relatively small and sensitive C sink, and C has been accumulating **since 1850**.

Question 4

Carbon cycle:

Where do the rest of the labels go?

- A. Carbon dioxide in the atmosphere
- B. Photosynthesis
- C. Fossil fuels
- D. Decomposition
- E. Cellular respiration
- F. Combustion



Question 5

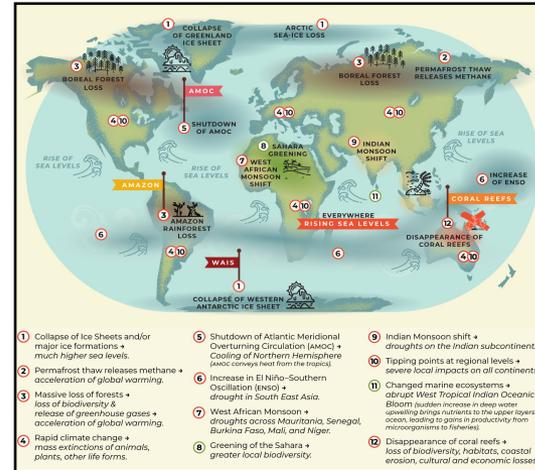
When will we first see the effects of climate change?

- About 10 years from now
- About 50 years from now
- About 1000 years from now
- We can already see them now!

Question 6

Which countries have caused the most climate change so far?

- Uganda
- China
- United Kingdom
- United States of America
- Saudi Arabia



Question 7

Tipping points

Possible but less likely rapid climate change triggers

I have heard about some of these before:

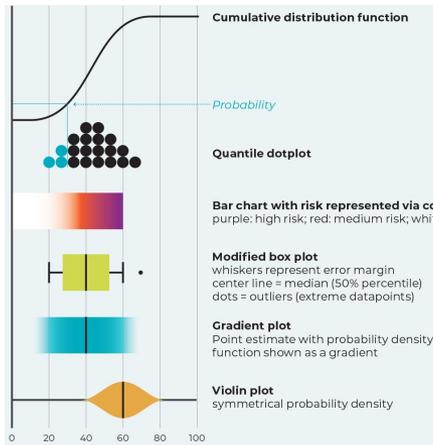
- a) Yes
- b) No

Question 8

Reading graphs + charts

I have seen at least one of this type of representations of data / statistics before.

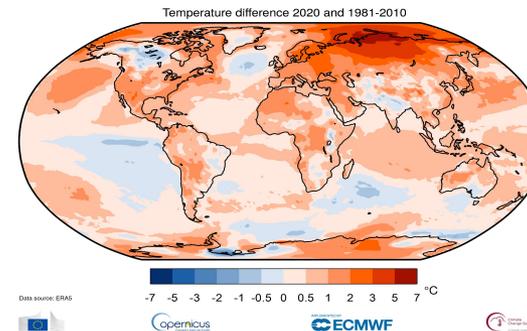
- a) Yes
- b) No



Question 9

Reading graphs + charts

Where has it warmed the most?



According to the map, which one has warmed more?

- a) Arctic
- b) Uganda

Question 10

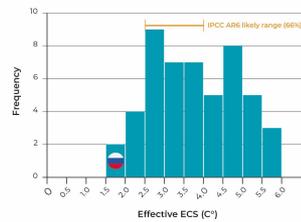
Reading graphs + charts

ECS is the temperature rise if CO2 doubles

EQUILIBRIUM CLIMATE SENSITIVITY (ECS)

IPCC AR6 CMIP6 climate models

Russian flag



Data compiled by Mark Zelinka.

Are Russian climate computer models that are part of IPCC's recent report more sensitive to doubling of CO2 in the atmosphere than average, meaning they have higher ECS values?

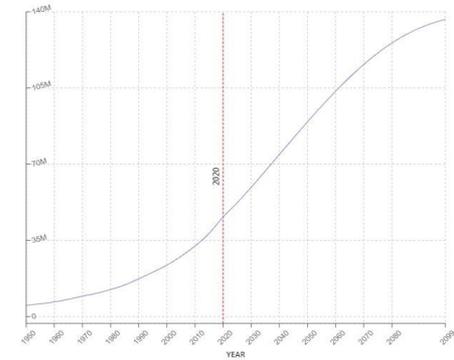
- a) Yes
- b) No

Question 11

Reading graphs + charts

Guess the label

- a) Tonnes of CO2 in the atmosphere
- b) iPhone users in London
- c) Population in Uganda
- d) Discovered planets in other galaxies



Question 12

Reading graphs + charts

Climate Science centers (IPCC)

The map shows contributing countries. 1 dot = 1 research institute. "There are more institutes in South America than in Australia".

- a) True
- b) False

NORTH AMERICA	SOUTH AMERICA	EUROPE	AFRICA	ASIA	AUSTRALIA
•	•	•••••	•	•••••	•••••
🇺🇸 🇨🇦	🇧🇷	🇩🇪 🇩🇪 🇩🇪 🇩🇪 🇩🇪	🇳🇮	🇨🇳 🇨🇳 🇨🇳 🇨🇳 🇨🇳	🇦🇺 🇦🇺 🇦🇺

Flags = CMIP6/ESF contributing countries | 1 dot = 1 contributing institution in the data source

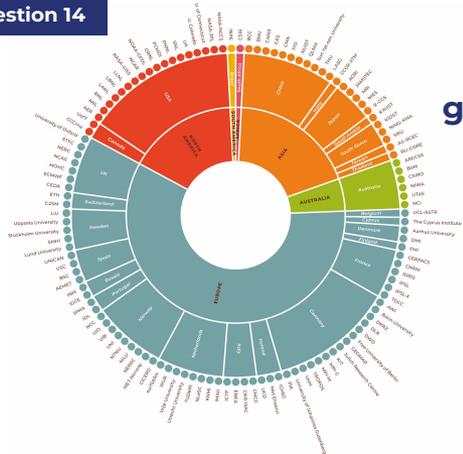
Question 13

Numeracy

1 billion tonnes (1 Gt) is the same as:

- 100 tonnes
- 1000 tonnes
- 1000000 tonnes
- 1000000000 tonnes

Question 14



Reading graphs + charts
Pie charts

This chart shows where climate data is collected.

"Where more people live, more data is collected."

- a) True
- b) False

Question 15

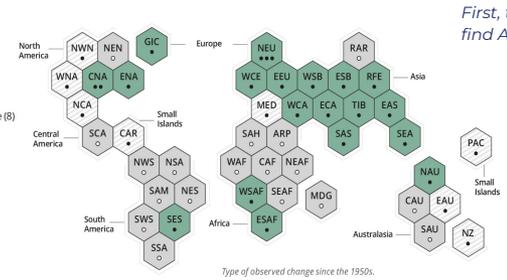
Reading charts + graphs

Type of observed change in heavy precipitation

- Increase (19)
- Decrease (0)
- Low agreement in the type of change (8)
- Limited data and/or literature (18)

Confidence in human contribution to the observed change

- High
- Medium
- Low due to limited agreement
- Low due to limited evidence



First, try to find Africa ...

What does the chart above say about changes in rain (precipitation) in Uganda?

- a) Increase
- b) Decrease
- c) Can't determine

Question 16

Climate: Uganda

Rains around Kampala are influenced by ...

Check all that apply:

- Indian Ocean
- Pacific Ocean
- Kampala being a large city
- Irrigation in India
- Climate change
- All of the above

Question 17

Greenhouse effect

What does the name mean?



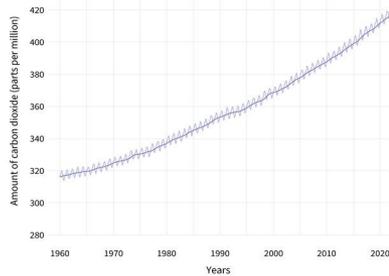
- Making the outside air colder
- Keeping the warmth from escaping the atmosphere

Question 18

Global CO2 concentration

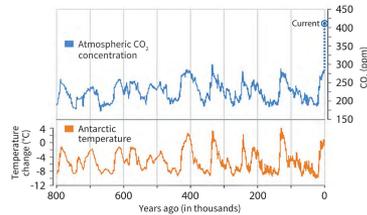
Why are the lines wiggly?

ATMOSPHERIC CARBON DIOXIDE (1960-2021)



“Winters!” is the right answer for

- a) The graph on the left
- b) Two graphs below



Question 20

Climate or weather?

Which boxes are climate:

- 1) Largely tropical, with two rainy seasons
- 2) Tropical savannah, tropical forests and arid steppe
- 3) This is a cold evening; it is 17 degrees
- 4) Yesterday it rained all day
- 5) December to February are the hottest months
- 6) Soon it will be too hot
- 7) It does not snow in Uganda
- 8) 5000 years ago Sahara was green
- 9) “Changes in air temperature, not precipitation, drove the expansion and contraction of glaciers in Africa’s Rwenzori Mountains at the height of the last ice age”

Kampala + Add to My Locations 10

Tonight Low 17° A clear sky and a gentle breeze

Sat 22nd 28° 19° Sun 23rd 26° 18° Mon 24th 28° 18°

Question 19

The Paris Agreement

Global Politics

- Red wine must come from Bordeaux region
- Limiting the size of ozone hole
- Keeping the rise in global temperatures well below 2 degrees

Answer 20

Climate or weather?

These ones refer to “climate”

- 1) Largely tropical, with two rainy seasons
- 2) Tropical savannah, tropical forests and arid steppe
- 7) It does not snow in Uganda
- 5) December to February are the hottest months
- 8) 5000 years ago Sahara was green
- 6) Soon it will be too hot
- 9) “Changes in air temperature, not precipitation, drove the expansion and contraction of glaciers in Africa’s Rwenzori Mountains at the height of the last ice age”
- 6) “Soon it will be too hot” can be the a reference to climate if “soon” is taken to mean decades, but it is more likely to describe weather if “soon” is understood to be a matter of hours, e.g. “this afternoon”.

It is the opening line of the novel *The Drowned World* by JG Ballard.

