Falkirk Science Festival

Blue Carbon Workshop

Marcelina Lekawska & Professor Bill Austin
University of St Andrews

A little bit about me...

- Polish
- Student
- Love nature (especially the ocean!)
- My dream job...

Contact details (for parents):
ml288@st-andrews.ac.uk

LEARNING GOALS

By the end of this lesson, you will know ...

- What blue carbon is and where it is found
- How saltmarshes act as tools to fight climate change
- How we can protect saltmarshes in the future

And....

- **Have fun throughout!**

What is blue carbon?


PA


UN Environment


Peter Prokosch


News Atlas

Saltmarshes

BBC

Dibyasha Das

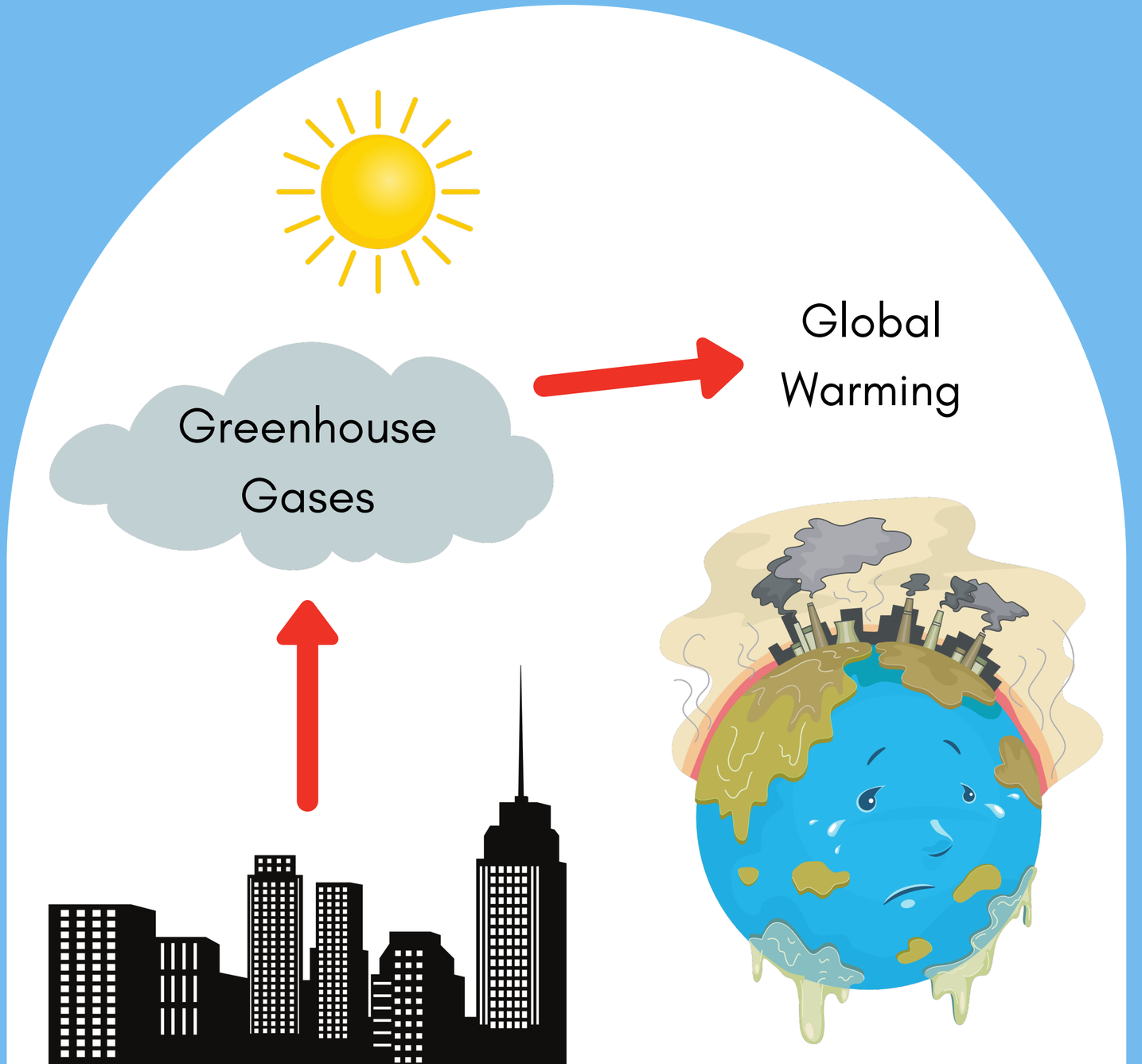
North Norfolk

Jim Densham

CLIMATE CHANGE

Human activities release **greenhouse gases.**

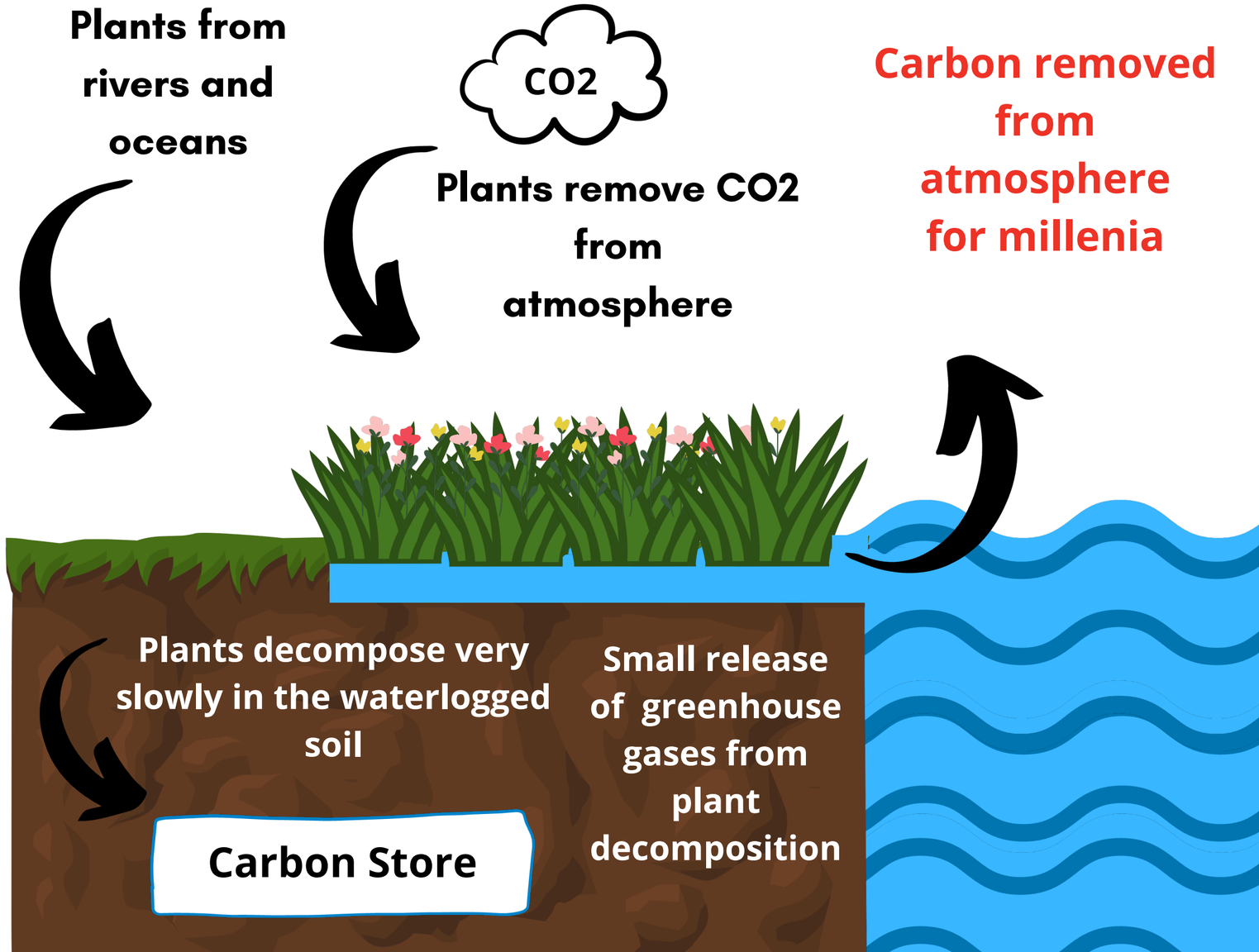
These act like a blanket, leading to **global warming**.



Nature Based Solutions

Fighting climate change **with nature**

Carbon Sequestration




Bill RSS V1 Subtitled
Watch later
Share
and as they photosynthesise, they fix carbon,
locking it in the ground.
Watch on YouTube


Saltmarshes remove carbon from the atmosphere
This helps limit global warming!

Activity #1

Blue carbon word search

10 minutes

BLUE CARBON WORD SEARCH

Can you find these five words relating to blue carbon?

B	N	Z	G	J	C	D	I	S
N	M	J	V	X	Y	I	A	E
K	O	L	I	O	S	L	F	G
M	O	B	A	O	T	H	K	A
Q	H	P	R	M	B	Q	W	R
F	D	L	A	A	Q	Q	T	O
W	I	R	T	A	C	Y	S	T
K	S	D	O	Q	F	K	L	S
H	C	O	A	S	T	A	L	R

Carbon

Storage

Saltmarsh

Soil

Coastal

SOLUTIONS

When you have had a go at the word search have a look at these answers. How many words did you manage to find?

Saltmarshes are coastal ecosystems. They remove carbon dioxide from the air and store carbon in their soils. This helps fight climate change.

Questions

THE PROBLEM

Saltmarsh areas are being lost

At an alarming rate

Half of UK area lost in last 300 years

They experience many pressures

Related to human activity

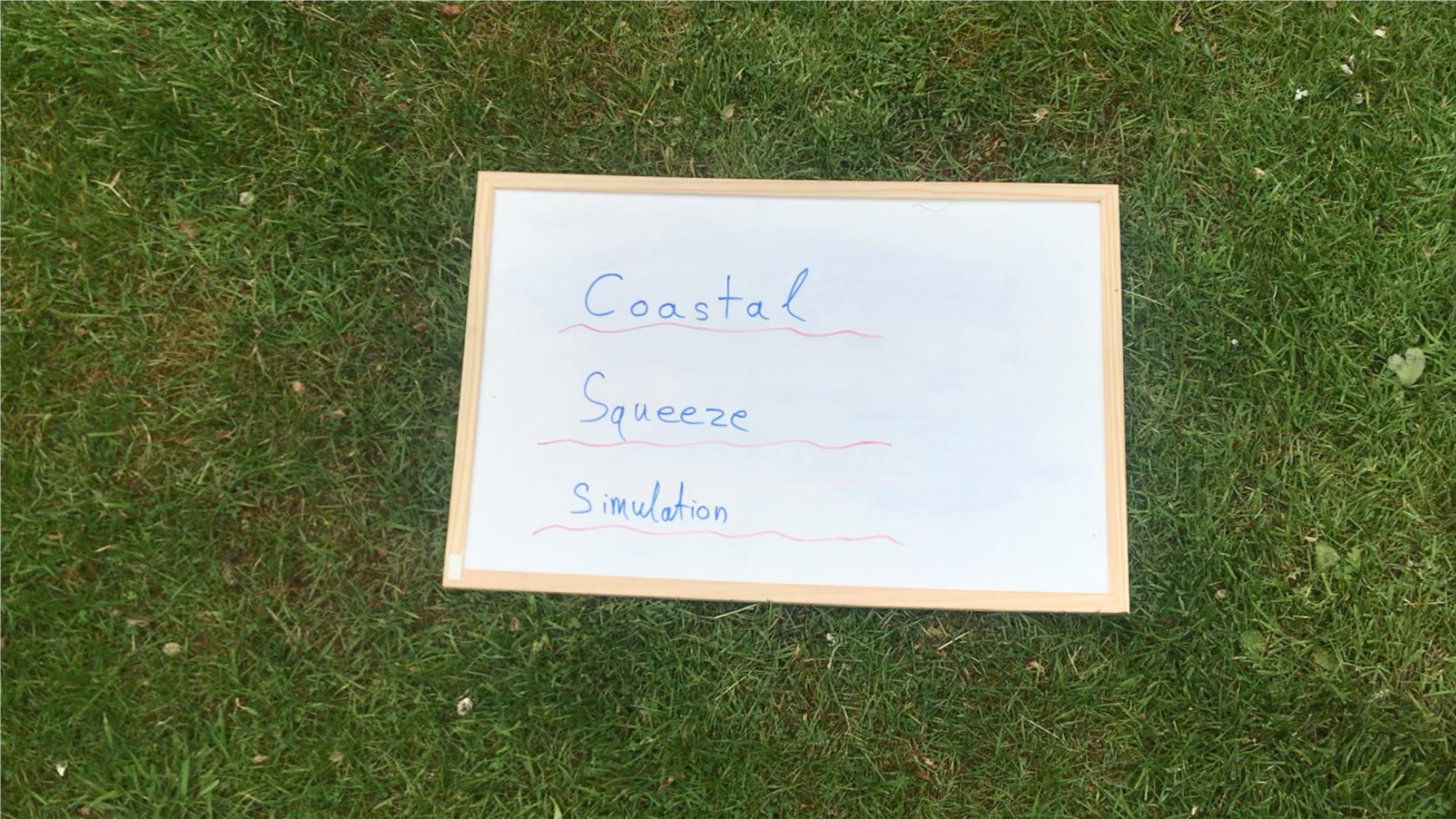
When disturbed, they release carbon

Adding to global warming

Activity #2

Coastal Squeeze Simulation

20 minutes


Coastal
Squeeze
Simulation

- [ ] **Use the video and worksheet to complete the experiment**
- [ ] **Have a go at the questions**
- [ ] **Check the answer sheet**

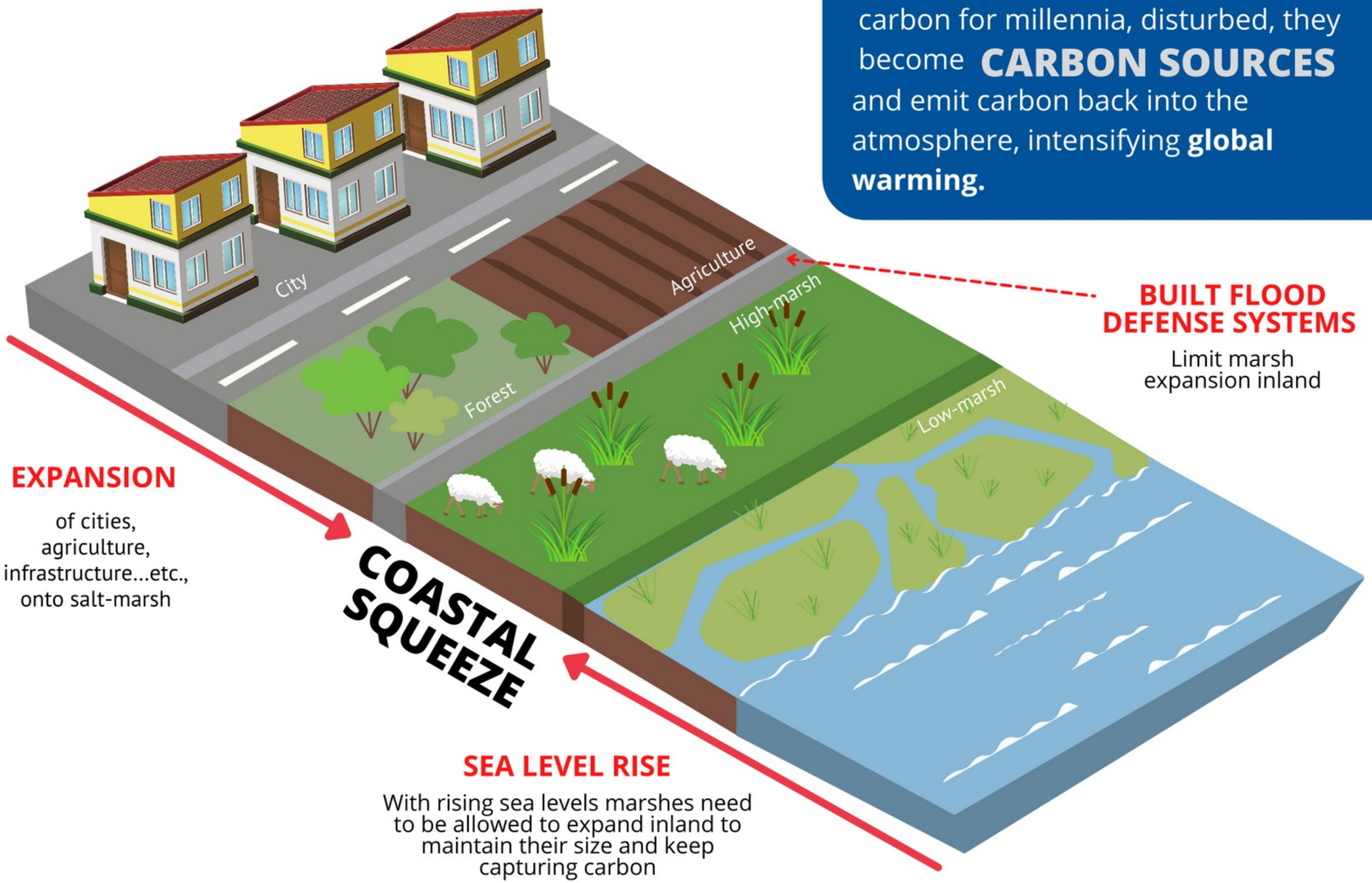
I will be here if you have any questions!

Questions

The biggest threats to saltmarshes are sea level rise and human development

University of St Andrews

Undisturbed, saltmarshes store carbon for millennia, disturbed, they become **CARBON SOURCES** and emit carbon back into the atmosphere, intensifying **global warming.**



BUILT FLOOD DEFENSE SYSTEMS

Limit marsh expansion inland

EXPANSION

of cities, agriculture, infrastructure...etc., onto salt-marsh

SEA LEVEL RISE

With rising sea levels marshes need to be allowed to expand inland to maintain their size and keep capturing carbon

We can help saltmarshes!

1) Protect

existing saltmarshes from human developments.

Leave room to allow them to migrate up the coasts as sea levels rise.

2) Restore

degraded saltmarsh habitats

3) Create

new saltmarshes!

In spots with the right conditions.

Skinflats - Saltmarsh Restoration

- **Creating a saltmarsh**
- **Giving land back to nature**

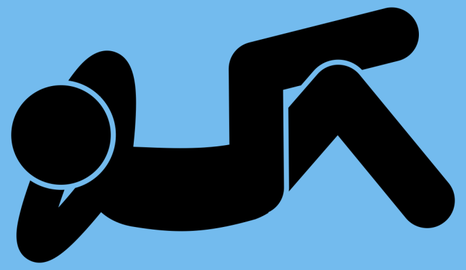
- 2009 - beginning
- 2018 - seawall breached

rspb giving nature a home

Net-Zero Emissions Walking Trail!

FALKIRK EXPLORED

route seven Skinflats



Let's take a 10-minute break!

Activity #3

Meet the researcher

10 minutes

Professor Bill Austin

University of St Andrews

SCOTTISH OCEANS INSTITUTE

Please, **submit questions** using this link!

https://app.sli.do/event/m7s6mwdc

Event code: 966286

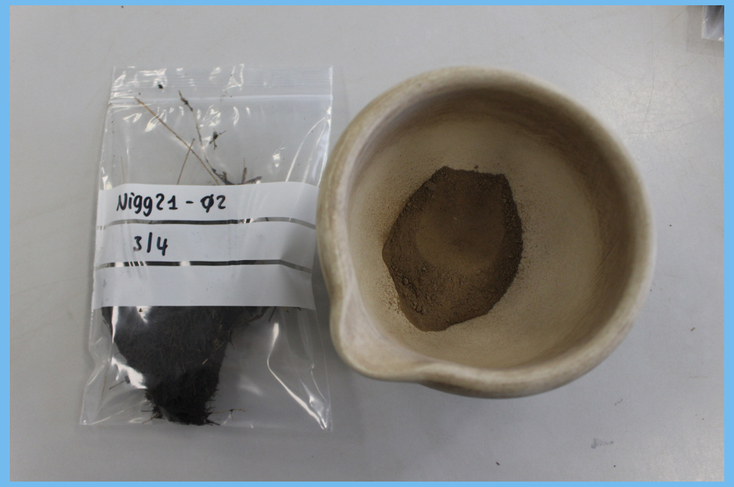
In the lab

1)

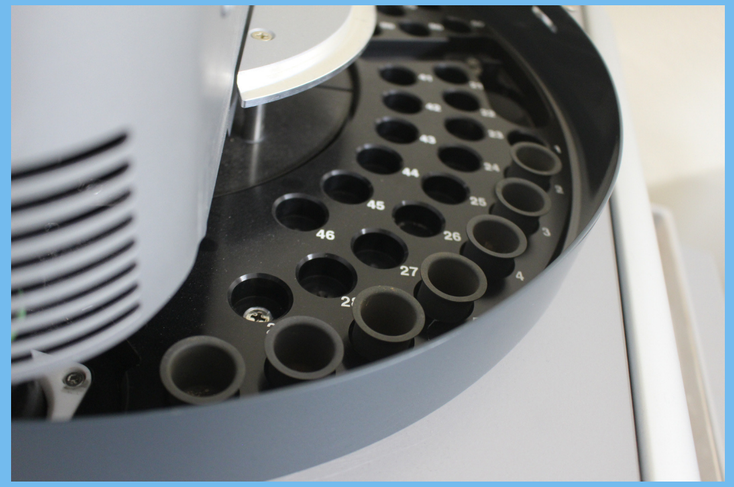
2)

3)

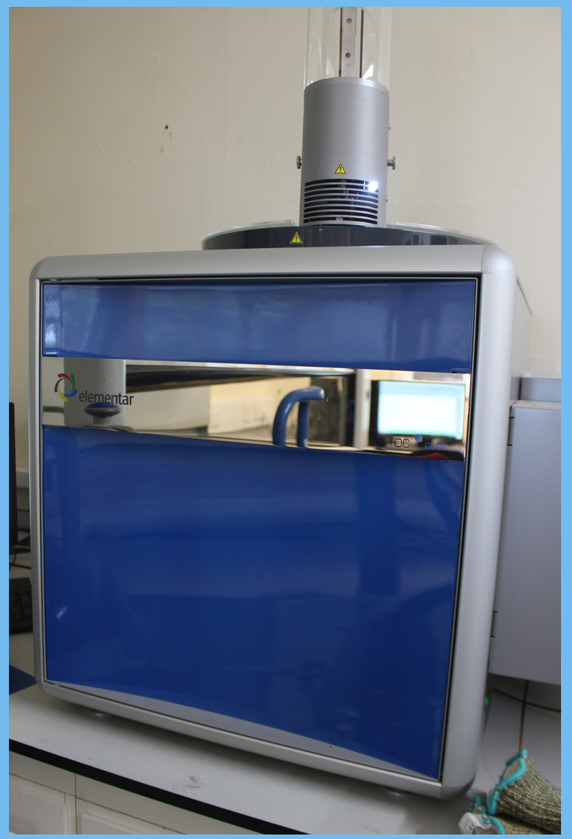
4)



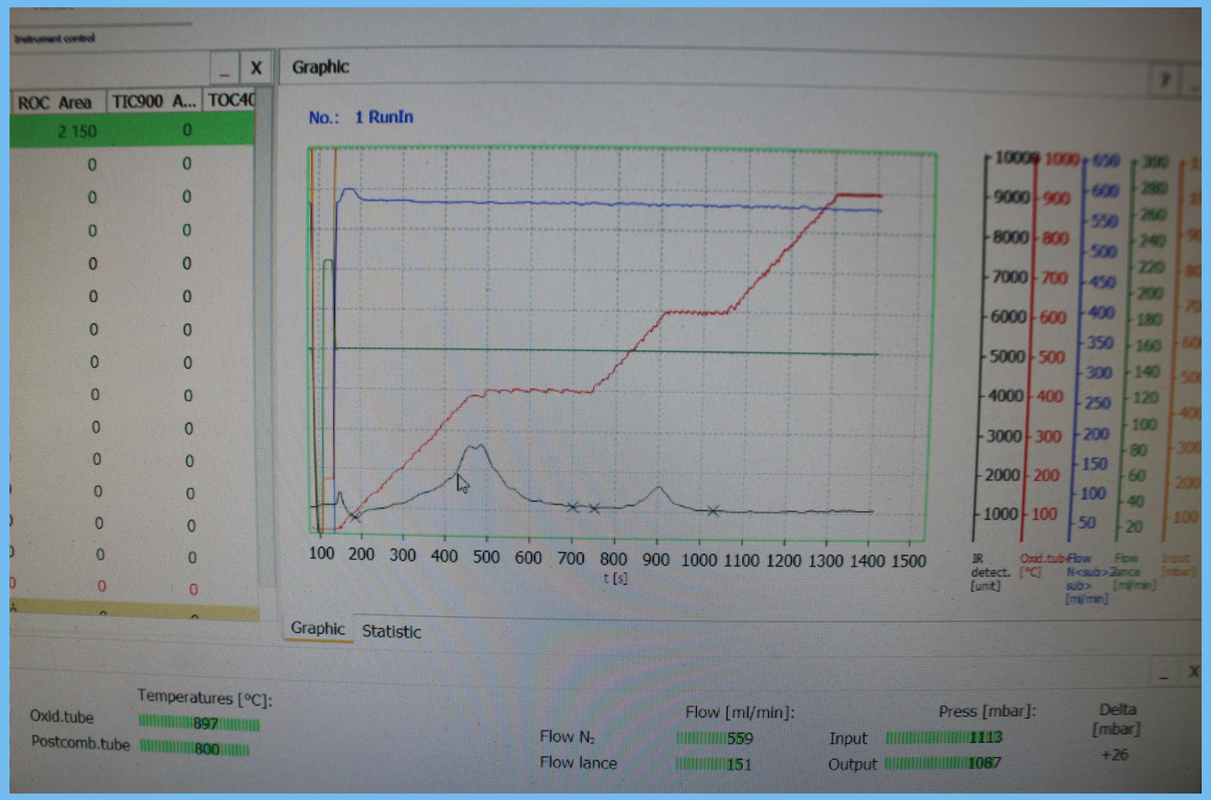
5)



6)



7)

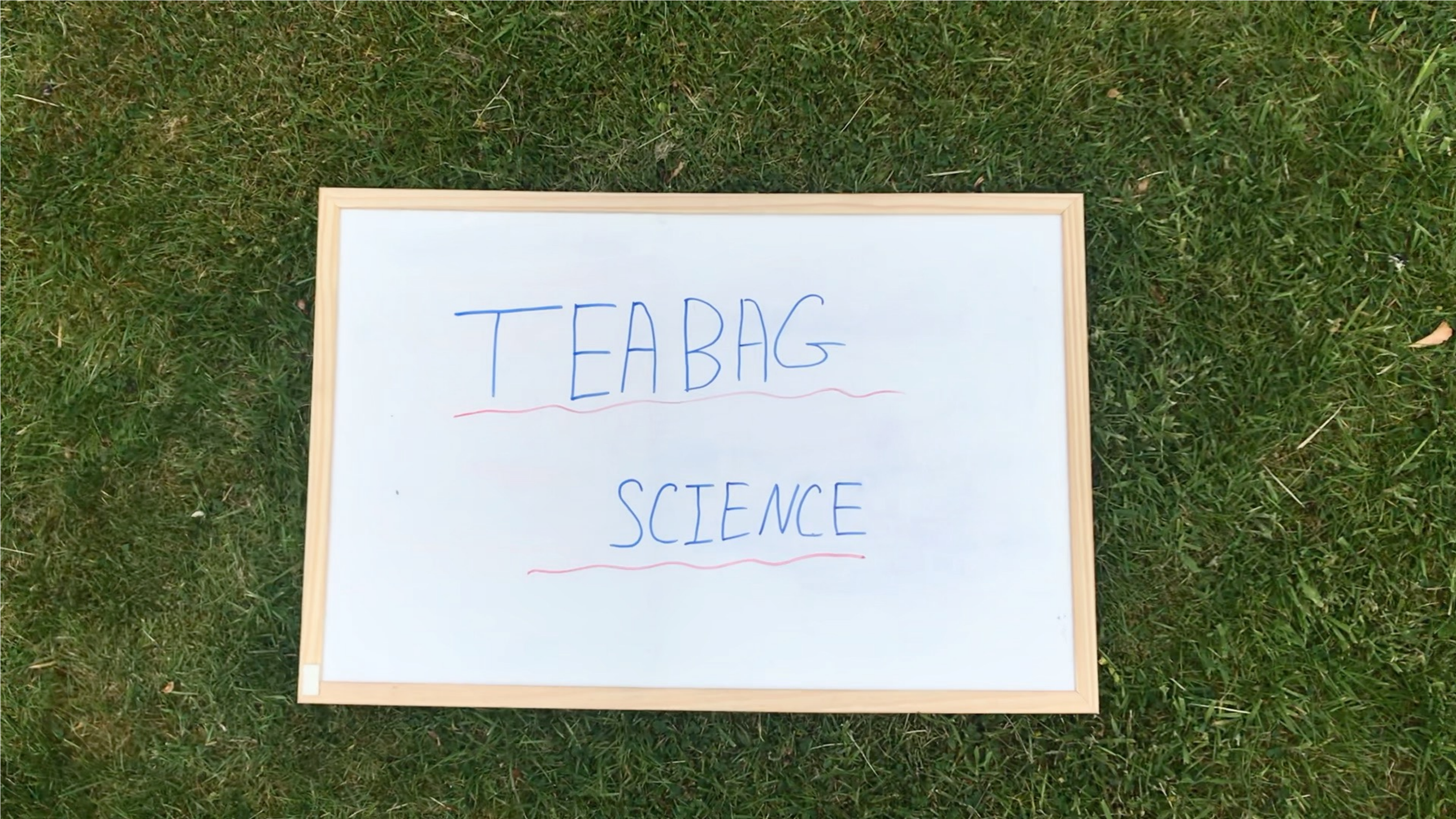


- Total Organic Carbon Stock (TOC %)
- **How much carbon is stored in the saltmarsh?**
- Can compare...
  - Between saltmarshes
  - Different depths
  - Change over time

Activity #4

Teabag experiment

15-20 minutes


TEABAG
SCIENCE

Teabag Science:

Your own blue carbon experiment!

University of St Andrews

1) Weigh two teabags

Ideally rooibos or green tea

2) Bury in garden

Choose two locations: One with wet soil (to simulate a saltmarsh)

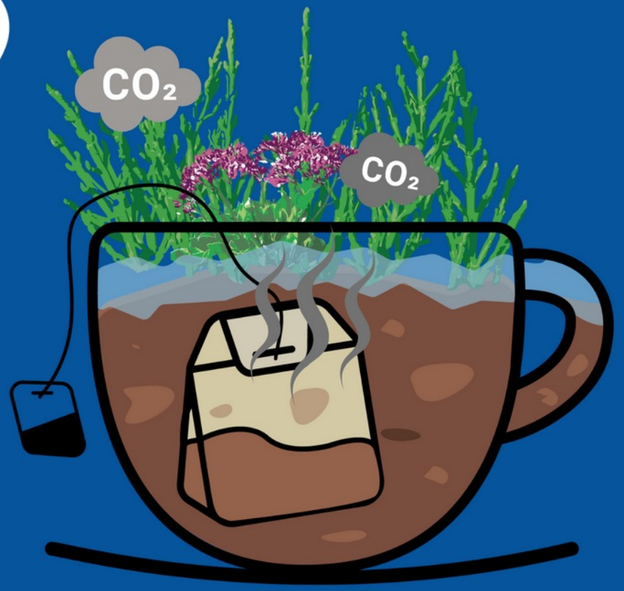
Wait

For 2 weeks

3) Dig up, dry and weigh

How did the weight of each teabag change?

?



Organic material decomposes much slower in wet environments such as saltmarshes

Less change in weight

Less greenhouse gases released!

- [ ] **Use the video and worksheet to complete the experiment**
- [ ] **Have a go at the questions**
- [ ] **Check the answer sheet**

I will be here if you have any questions!

Questions

Activity #5

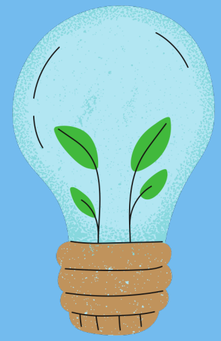
The future of blue carbon

10 minutes

Your ideal saltmarsh!

Use your new blue carbon knowledge to draw the perfect saltmarsh! Think of the animals and plants you may find, the threats saltmarshes face, and how we could help solve them.

What inspired your drawing? What do you hope to see in the future of saltmarshes?



DID WE MEET OUR GOALS?

By the end of this lesson, you will know ...

- What blue carbon is and where it is found
- How saltmarshes act as tools to fight climate change
- How we can protect saltmarshes in the future

And....

- **Have fun throughout!**

UN CLIMATE CHANGE CONFERENCE UK 2021

IN PARTNERSHIP WITH ITALY

Extra Resources

C-Side project

The Blue Carbon Initiative

IUCN

Blue Forest Solutions

Videos about blue carbon –
https://www.youtube.com/watch?v=KujRa-BDRaI

https://www.youtube.com/watch?v=4fNW8spFS_o

https://www.youtube.com/watch?v=P9m7vAdqsWc

Saltmarshes vs. rising sea levels -

Can saltmarshes outrun rising sea levels?

Can saltmarshes be saved?

Saltmarsh restoration at Poole Harbour