Professor Jigget Carbon Clever Challenge Quiz

Here are all the right answers. One point for every correct box!

Which of these creatures loves cotton grass?

- Frog
- Dragon Fly
- Large Heath Butterfly ✓
- Water Vole

The Large Heath, or Manchester Argus Butterfly moves around on cotton grass.

Which ones did Professor Jigget say were 'poison'?

- Carbon Dioxide
- Pesticides ✓
- Plastic Bags ✓
- Peat

Carbon dioxide is good and very important. It *can* cause problems **if we have too much** ('overwhelm') but it is not 'poison'.

But **any amount** of plastic or human-made pesticides can poison animals in nature.

Peat (from the mosslands) is...

- Decaying matter ✓
- Very wet ✓
- Full of carbon ✓
- Food for birds

Lots of plants **grow *in*** peat, but animals don't eat it.

Which of these areas was caused by mining?

- Mosslands
- Flashes ✓
- Wetlands
- Manchester

Flashes form when water fills up in big holes left after mining and then plants grow.

Great crested newts, water voles and frogs are all...

- Naughty
- Aquatic
- Semi-aquatic ✓
- Vegetarian

Semi aquatic animals spend a lot of time in the water, but not *all* the time like fish do.

Water voles are vegetarian, but the other two eat insects.

Which of these animals are in danger?

- Willow Tits ✓
- Great Crested Newts ✓
- Argus Butterflies ✓
- Bog Brush Crickets ✓

Sadly, *they all are* because their habitats are damaged or destroyed by what people do.

A wetland is wet ...

- All year round
- In the winter
- When it rains
- Most of the time ✓

Some wetlands are wet all the time, but they are all wet most of the time!

People dig up coal so that they can use it to...

- Make diamonds
- Colour things black ✓
- Heal People (Medicine)
- Burn as Fuel ✓

Diamonds **are** made from carbon, *and so is coal*, but *diamonds aren't made from coal*!

Burning coal can power machines and generate electricity, and keep homes warm (old coal fires!)

"Goodbye, and good..."

- Luck
- Riddance
- Goal
- Gravy ✓

Professor Jigget really really likes gravy a lot.

Flashes

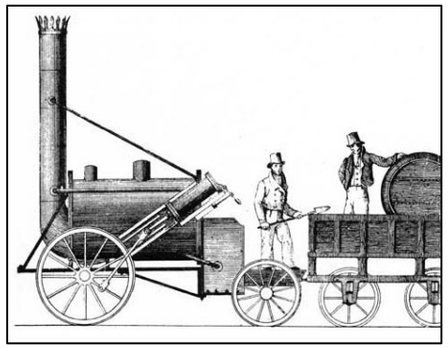
The Flashes of Wigan and Leigh were formed when the ground sank and filled with water, making lakes. Find the picture and name for *the reason why the ground sank...*

Coal Mines

This all started during the Industrial Revolution, which began in North West England about

270 years ago

Find the picture and name for *something really important that was invented in the Industrial Revolution...*



Steam engine

Find the picture and name for a rare animal that loves the Flashes.

Willlow Tit

A fun fact about this animal goes below...

A group of these animals is called a ‘Banditry’

Where this animal lives goes below...

Wet woodland

Which of these might you see in the Flashes?

Huge variety of water birds	✓
Rare orchids	✓
Dragon boating	✓
Scientists studying nature	✓

Can you write 3 other things that were *invented in the Industrial Revolution?*

1)

2)

3)

Mosslands

The mosslands formed very slowly, and they are some of our most precious wild places. Find the picture and name for *one of the most important plants in the mosslands...*

Sphagnum Moss

The mosslands started to form after the end of the last ice age, which was over...

10,000 years ago

Find the picture and name for *something really important that is found throughout the mosslands* – it is what makes them so special

Peat (not Pete)

Find the picture and name for a rare animal that loves the mosslands.

Manchester Argus Butterfly

A fun fact about this animal goes below...

This animal has just returned to the area after 150 years!

Where this animal lives goes below...

Cotton Grass

Mosslands help with

Climate change	✓
Flood prevention	✓
Fibre for spinning	
Habitats for wildlife	✓

Can you write 3 other species (plants or animals) that live in the mosslands?

1)

2)

3)

Mersey Wetlands Corridor

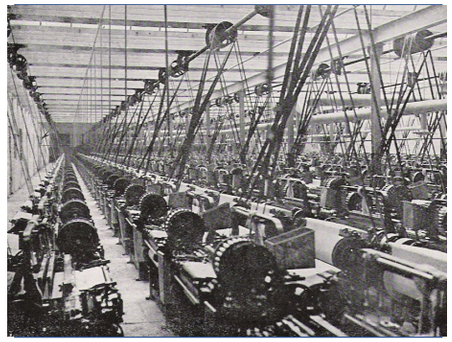
The Mersey Wetlands Corridor is the area around the river Mersey and another waterway. Find the picture and name for this other world-famous waterway

Manchester Ship Canal

Construction of this waterway, the largest of its kind in the world at the time, began about...

130 years ago

Huge amounts of *something* was sent from India to Manchester for many years – it was big business! Find the picture and name for *where it was sent to...*



Cotton mills

Find the picture and name for a rare animal living in the wetlands

Great Crested Newt

A fun fact about this animal goes below...

Females lay 200-300 eggs and they can live up to 27 years!

Where this animal lives goes below...

Ponds

Which of these are 'wetlands'?

Mersey Wetlands Corridor	✓
Flashes	✓
Mosslands	✓
The Ocean	

Name 3 things you might find in a canal

1)

2)

3)

This is just a quick look – can you see how much everything is connected and affects everything else?

Why we changed the landscape

People did this → For this reason → To meet the need for → Leading to this problem

Mined for coal

And later on people also started drilling for oil which is another fossil fuel like coal that releases too much carbon when we burn it

Built on and cut up the mosslands

People cut the mosslands to get the **peat** which can be used as fuel (to burn) or as compost to help things grow. *But it is better in the wetlands where it belongs!*

Built a huge canal between Manchester and the sea

To transport things to & from other countries

And what do you think made the big ships go... you guessed it *steam ships*, from **burning even more coal**

To build houses

To burn as fuel

When we burn coal as fuel, it releases Carbon into the air

To grow food

Keeping warm & comfortable

*All these things are good – **we need them** – but the way we get them has been leading to problems so we need better ways!*

Eating

Generating electricity for lights

Getting things we can't make here (like raw cotton or tea)

Destruction of habitats for wildlife

If we take **all** the space for our homes and factories then where will wildlife live? We need to learn to share and care!

Since we have been using fuel and machines for everything, we have been burning fossil fuel that puts too much Carbon in the air. This contributes to climate change

Climate change

Climate change means that the conditions are changing all over the world (mostly getting warmer) which makes it difficult for people and wildlife who are used to the way it is now

Polluting the water

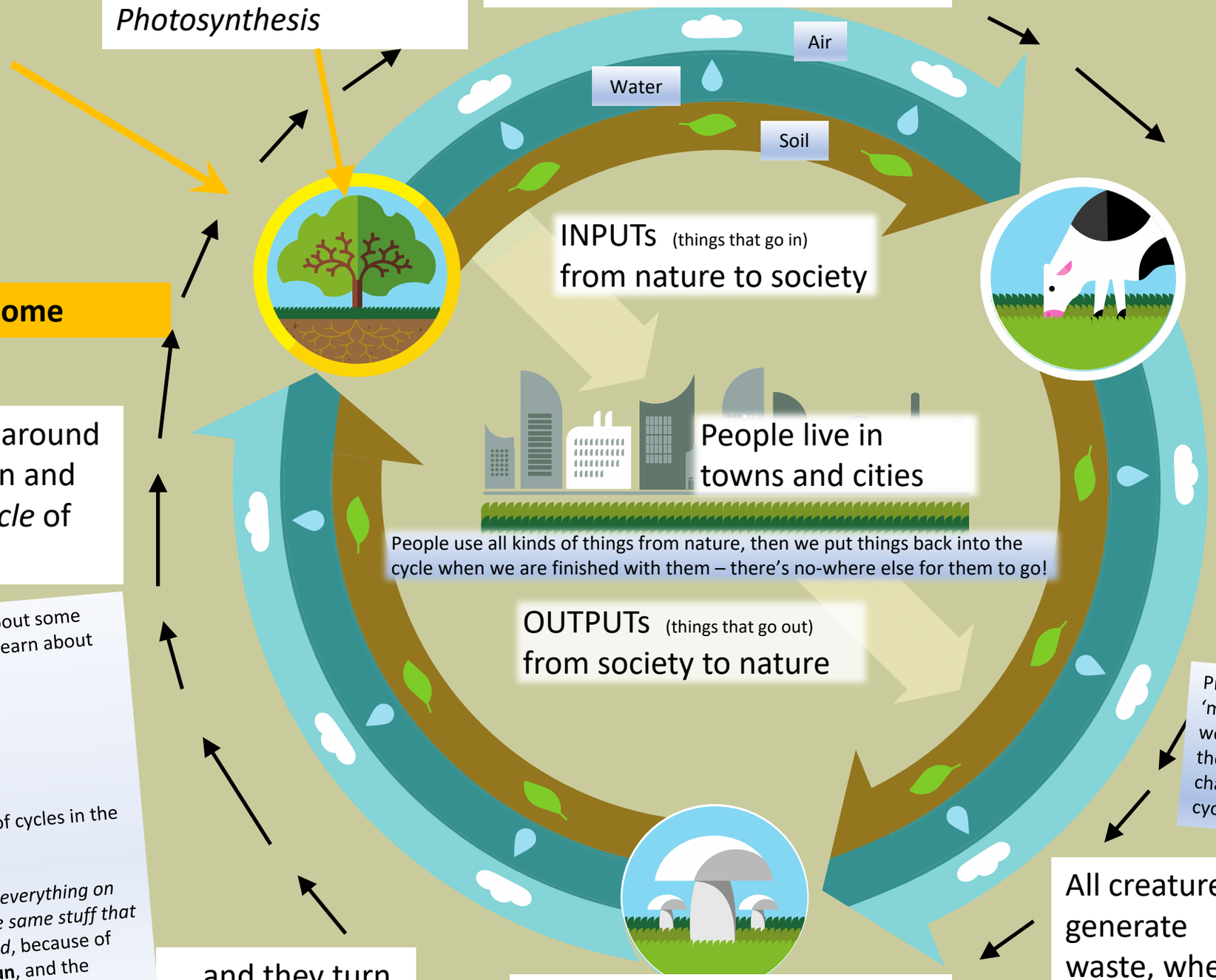
Which is bad news for fish, **and** anyone who eats them!

The Earth, our home

It all starts with energy from the *sun* which we see and call *Sunlight*

The energy from space can be 'eaten' by plants as 'food' because they can do something that scientists call *Photosynthesis*

This energy, together with *Carbon Dioxide* from the air, and *Water* from clouds and rivers, and *Nutrients* from the soil, enables plants to GROW.



INPUTs (things that go in)
from nature to society

People live in towns and cities

People use all kinds of things from nature, then we put things back into the cycle when we are finished with them – there's no-where else for them to go!

OUTPUTs (things that go out)
from society to nature

These red wavy lines show something going off into space. What are they?

CO2	☐
Cow farts	☐
Heat	✓
Pollution	☐

Heat is energy that goes off into space from the Earth - so the Earth doesn't get too hot! 'Pollution' stays in the system.

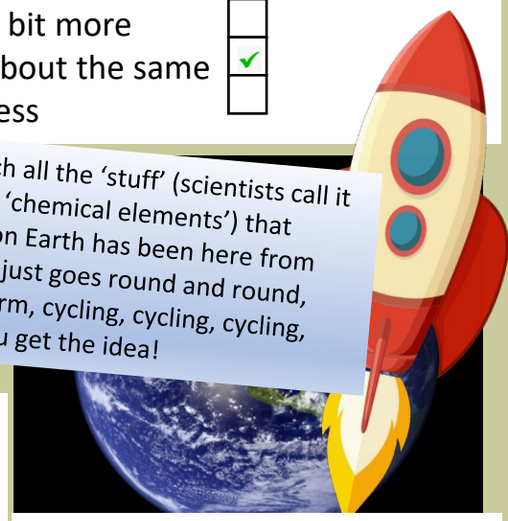
Cow farts are real, but they get trapped in the atmosphere, they don't escape. They even contribute to climate change!

Plants are eaten by Animals , including Humans
(but hopefully they don't mind being eaten)

How much do you think the Earth weighs *today,* compared to when it first formed 4,600,000,000 years ago?

A lot more	☐
A bit more	☐
About the same	✓
Less	☐

Pretty much all the 'stuff' (scientists call it 'matter' or 'chemical elements') that we've got on Earth has been here from the start. It just goes round and round, changing form, cycling, cycling, cycling, cycling... you get the idea!



Hard Question: The Earth is like a SPACESHIP because it is:

Self-centred	☐
Self-contained	✓
Self-conscious	☐
Self-directed	☐

self-contained *means* ***everything needed is inside*** *– so yes!*

Ask your teacher about the other words!

All creatures generate waste, when they *Poo*.

... and eventually, everything *dies*.

So lots of waste stuff is made **every day**, and luckily we have *Decomposers* (including fungi like mushrooms and tiny creatures called bacteria) that just LOVE to eat everyone else's waste!

... and they turn waste back into *Nutrients* in the soil that new plants can use to grow.

Everything goes around and around again and again in a big *Cycle* of Life!

You might have learned about some other cycles, and you will learn about even more in the future.

E.g.
The Water Cycle
The Carbon Cycle
The Nitrogen Cycle
(There are lots and lots of cycles in the world!)

This cycle is about how *everything on the Earth is made of the same stuff that goes around and around*, because of **the energy from the sun**, and the **amazing plants** that can turn that into food and the **hero decomposers** that turn waste back into *'building blocks of life'* again which makes the whole fantastic thing possible for all of us!

The 3 ways people harm nature & wildlife

It's surprising, but out of all the different problems all over the world where nature and wildlife need help, there are only really three basic things that can go wrong.

Poison is something harmful that doesn't belong

Which of these are examples of poison?

Chopping down trees	
Building roads	
Cutting peat from the land	
Using toxic pesticides	✸
Burning fossil fuels	
Too many nutrients in water	
Plastic bags in the ocean	✸
Catching too many fish at once	

Toxic pesticides don't exist naturally and the decomposers have trouble eating them, so they cause problems. Same goes for plastic - it builds up and gets everywhere, harming living things.

Overwhelm is having *too much* of something that is usually good

Physical Damage is just breaking or destroying something

Which of these are examples of physical damage?

Chopping down trees	✸
Building roads	✸
Cutting peat from the land	✸
Using toxic pesticides	
Burning fossil fuels	
Too many nutrients in water	
Plastic bags in the ocean	
Catching too many fish at once	✸

If you chop a tree down, or a million trees down, you can see that hurts the trees, that's simple!

Catching a fish is a bit like chopping down a tree – it's not good for the fish! Sometimes people take nearly all of the fish and there are not enough left to breed any more baby fish!

Burning fossil fuels releases lots of Carbon Dioxide (CO_2) into the air. Plants breathe in CO_2 so it is good to have, but if there is **too much** it builds up and it is a big reason for climate change.

Nutrients are good right? Yes! But like CO_2, if you get **too many** all at once, they can put things **out of balance** and cause problems. Too much of anything good can be a problem sometimes!

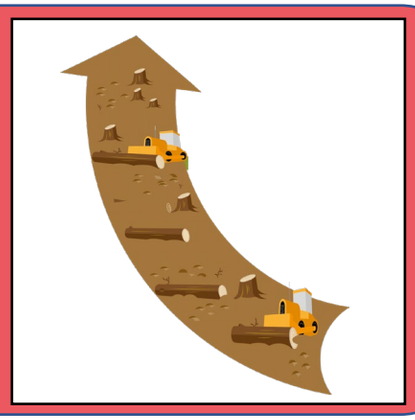
Which of these are examples of overwhelm:

Chopping down trees	
Building roads	
Cutting peat from the land	
Using toxic pesticides	
Burning fossil fuels	✸
Too many nutrients in water	✸
Plastic bags in the ocean	
Catching too many fish at once	

This gives us a clear and easy guide to how we can find new ways to do things that support nature and wildlife instead of harming them.

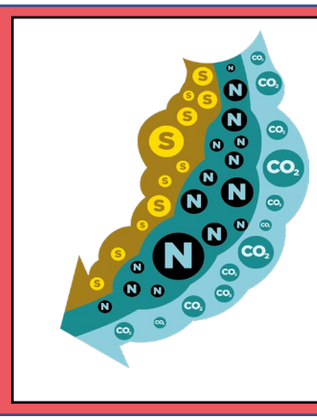
Unsustainable

Physically damage nature & wildlife (ecosystems)



'Poison' nature & wildlife with stuff that doesn't belong there

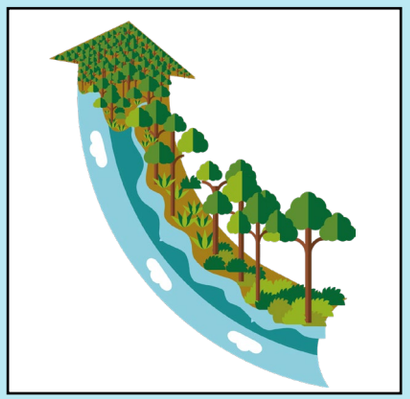
Overwhelm (too much too fast) with natural stuff like CO2 from fossil fuels



Sustainable

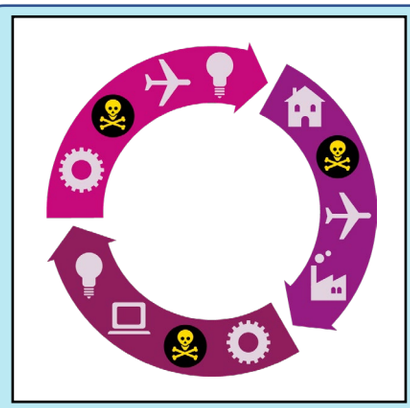
Balance flows of natural stuff

If we make sure that we put natural things back into nature in a way that is easy for nature to deal with, there will be no more overwhelm.



Restore & connect resilient ecosystems (nature & wildlife)

When we do things like protect habitats and plant trees and let nature thrive, we can hep nature recover.



Use materials safe for nature and cycle everything else again and again.

If we *really* need to use something that is harmful to nature – we can keep it 'in the loop' where we re-cycle it over and over again.

Sustainable

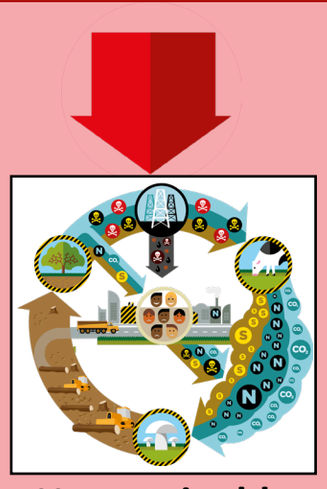
Nature

People

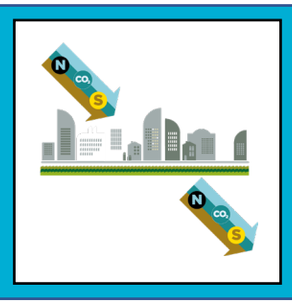
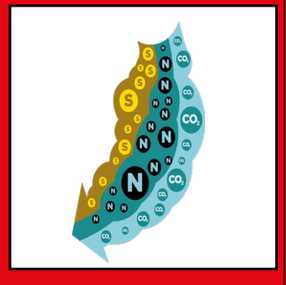
SYSTEM UPGRAGDE
New ways that don't cause the problems

CREATING CHANGE
Things we can do ourselves or together

Old ways causing the problems ('Business as Usual')



Unsustainable

Restore & connect resilient ecosystems (wildlife & nature) 	Balance flows of natural stuff like CO2 	Use materials safe for nature & cycle everything else repeatedly 	Move towards health and wellbeing for everyone 
Protect very large areas of land for nature & wildlife.	Enable all people & businesses to switch to renewable energy as much as possible.	Design products so they can be easily taken apart, so we can re-use everything in them.	In decisions big and small, look for ways to make things *fairer* for everyone, everywhere.
Make it so all neighbourhoods and schools have to include spaces for wildlife.	Design new buildings that need much less energy for heating and cooling.	Make it so *everything* we 'throw away', like packaging, is safe to be put into nature.	Make sure everywhere that people live has great places for children to play.
Join in with fun activities to help wildlife & nature!	Cycle or use public transport instead of a car, if you can.	For shopping use paper or cloth bags.	Be kind and helpful.
Do some nature-friendly gardening at home or school.	Turn lights off when you aren't using them.	Re-use things where possible instead of getting new stuff (e.g. clothes)	Learn lots and get good at things so you can do more to help yourself and others
Use peat from ancient peat bogs to help plants grow in pots or your garden.	Make all electricity from burning fossil fuels (oil & gas).	Just put anything in the bin and it will go away**.**	Just think of yourself, not anyone else.
Cut down rainforests to make space to grow food.	Build new towns and neighbourhoods so you need a car to get around.	Get new plastic bags every time you go shopping.	Always ignore other people's problems.
Physically damage nature & wildlife 	**Overwhelm (too much too fast) with natural stuff like CO2 (e.g. from fossil fuels)** 	**'Poison' nature & wildlife with stuff that doesn't belong there** 	**Cause harm to people's health and wellbeing**