CARBON CLEVER – RESOURCE PACK - OVERVIEW

A series of activities to explore the Carbon Landscape & our future

Nature & wildlife, our heritage, how this fits together in a bigger picture of the Earth, and how we can move towards a sustainable & healthy future for all.

KEYWORDS/TOPICS:

- Nature & wildlife
- Local history & heritage
- The Earth, cycles of life
- Climate change, pollution, plastics
- Sustainability, health, wellbeing, the future
- Water & wetlands

TOTAL TIME (ALL FOUR MODULES):

Approx 2hrs (bare minimum/ fast) – 3.5 hours (average)

The 4 modules can be split over several days, or delivered as a block.

SUBJECTS:

Science, History, Geography

KS2 (also reviews material from KS1 , taking a different angle)

INTRODUCTION

The Carbon Clever package of activities allows children to engage with our big challenges (such as climate change) in a positive way designed to increase clarity and sense of empowerment. It is based in the Carbon Landscape (www.carbonlandscape.org.uk) with a focus on the local landscape and heritage, combined with universally applicable science-based sustainability content (the RoundView).

OVERVIEW OF ACTIVITIES & LEARNING OUTCOMES

CARBON CLEVER SECTION & ACTIVITIES	PURPOSE / LEARNING OUTCOMES FOR CHILDREN
Module 1 ~ 10 - 30 minutes: Introduction / Warm up Professor Jigget Carbon Clever Video (~10 mins)* Professor Jigget Carbon Clever Quiz (~10 – 20 mins)  **all times represent a medium paced group activity with brief following discussion.* The animal icons are used to match up the different exercises throughout these resources.	This whole series of activities works with a set of physical games that cover the same topics, which is introduced by Professor Jigget (see Carbon Clever Challenge package). A short video (in 3 parts) is available to view which covers much of the same ground as the games, for when they are not played, Module 1 is a Professor Jigget Quiz which follows up from that which serves as an introduction/warm-up to the activities based on the information in the video and/or games.
Module 2 ~ 30 - 50 minutes: Our (Carbon) Landscape Landscape areas matching game activity (~20-30 mins)  Meeting our needs worksheet activity (~10-20 mins) 	Increased understanding of wetland habitats in the Carbon Landscape (mosslands, flashes, and the Mersey corridor), including animals and plants that live there and the history of the area. How the ways humans have been meeting their needs has affected the landscape and the conditions for nature and wildlife.
Module 3 ~30 – 50 minutes: Our (Living) Earth Cycles & Life' jigsaw' & quiz activity(~ 20-30 mins)  How we harm the Earth worksheet activity (~ 10-20 mins) 	Understanding a simple big picture of how everything cycles on Earth – how it works as a system. Using this knowledge to see how all of the environmental problems and challenges we face boil down to 3 basic ways people harm the Earth when meeting their needs.
Module 4 ~40 – 70 minutes: Our (Bright) Future Simple sustainability worksheet activity (~10-20 mins)  Actions for change matching game activity (~20-30 mins)  A bright future worksheet visioning activity (~10-20 mins)	By figuring out the positive opposites to the 3 ways we harm the Earth, we learn a set of guidelines for how humans could live in a fully sustainable way. Learn practical examples of what this might look like by grouping a set of actions Creative imagining exercise around what a positive future might be like and the children's potential roles & contribution.

MODULE 1) CARBON CLEVER INTRODUCTION/WARM-UP: LESSON PLAN PAGE 1

OVERVIEW

After playing the Professor Jigget games, or just watching the videos, a warm-up quiz based on material from the games and video.

Total time for module: 10 - 30 minutes

FORMAT

Groups of 2-4.

LEARNING OUTCOMES FOR CHILDREN

A broad introduction to nature and wildlife in the Carbon Landscape, and to a simple understanding of the ways that people can harm nature and wildlife.

Recognition that life on Earth works in a big cycle and that we can harm it, *or not,* depending on what we do.

PREPARATION & MATERIALS

Download (or prepare to watch online) the videos if necessary (more details will be with the files). If you are doing this session after playing the games, watching the video again may not be necessary.

Print the quiz sheets – one per group.

Print the answer sheets – one per child ideally.

A3 is much better (but not essential) for the exercises when possible - but the answer sheets can be A4.

ACTIVITIES

Play the games or watch the short videos (there are 3, one for each 'character area' of the Carbon Landscape).

(You may wish to watch the videos even if you have played the games if time has passed and a recap is appropriate.)

Hand out a quiz sheet for each group to fill in. It is multiple choice based on the information in the videos/games.

Hand out the answer sheets (one per child ideally so everyone gets to keep their own copy of the answers to look back on). Discuss as appropriate.

DIFFERENTIATION

To make easier (options)

a) Hand out the sheets before watching the videos so the children know what to watch and listen out for.
b) You could do it in smaller chunks (one video, find any answers, then the next)
c) Please remember it is a warmup and the ground will be covered more thoroughly during the other module/activities.

EXTENSION ACTIVITIES

There is plenty of scope to discuss and explore each of the questions and answers in a more detail. Were any of the questions particularly challenging or confusing?

The main activities in Carbon Clever that follow will help to understand all of these topics more clearly.

KEY DISCUSSION TOPICS & CURICCULUM LINKS

As a warm-up, introduction, this first module draws from content in all of the following modules and is not designed to teach any different content in and of itself.

The following themes from Carbon Clever are touched upon lightly in the quiz:

- Nature and wildlife in the area
- Different types of habitat
- How people have harmed the environment & why

FILES/DOWNLOADS

All resouces are included in the following two files:

Carbon Clever All Questions only (print one per group).pdf

Carbon Clever All Answers only (print one per person).pdf

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.

MODULE 2) OUR (CARBON) LANDSCAPE: LESSON PLAN PAGE 1

OVERVIEW

Exploring the nature and the heritage of the unique areas within the Carbon Landscape.

Total time for module: 30 - 50 minutes

FORMAT

Groups of 2-4.

NB. The pieces need preparing (printing & cutting) – this can be done with the children as part of the exercise, or prepared in advance.

LEARNING OUTCOMES FOR CHILDREN

Increased understanding of wetland habitats in the Carbon Landscape (mosslands, flashes, and the Mersey corridor), including the animals and plants that live there and the history of the area.

Understanding that it is the **ways** humans have been meeting their needs has affected the landscape and the conditions for nature and wildlife. Very gentle introduction to the complexity of real-world systems!

PREPARATION & MATERIALS

Main exercise - **Landscape Character Areas Matching Game**
Follow up exercise – **Meeting our needs worksheet**

Print and cut the sheets and pieces

A3 is much better (but not essential) for the exercises when possible - but the answer sheets can be A4.

Print **one set** of everything in the Questions/exercises file **for each group**. This comprises:

- 3 character area sheets (one for each area)
- 1 sheet of images and words that will be placed on the character area.
- 1 carbon landscape map
- 1 follow up exercise worksheet

Print **one set** of everything in the Answers file **for each child**. This comprises:

- 3 answers sheets for the main exercise
- 1 answers sheet for the follow up worksheet.

Cut the pieces out for the main Landscape matching game. Children can do the cutting themselves as part of the exercise if appropriate.

When possible, children can use paper glue to stick the pieces down onto the backing sheets during the exercise. This can be more satisfying (though not required) – and it also means the work will stay intact at the end so no need to take a photo if wish to keep the work done after the activity is finished.

ACTIVITIES

Main exercise - **Landscape Character Areas Matching Game**

1. Hand out everything except the answer sheets to the groups.
2. The task is to place the images and words onto the correct backing sheet in the right place. The map is just for reference – there is nothing needed to do on it unless it is used in extension activities
3. The images and words can be stuck down, but if doing this, encourage the children to wait until they have figured out where everything goes so they can change their minds!
4. There is also a small multiple choice and a free-form question on the sheet for the groups to fill in using pen once the matching is completed.
5. When ready, hand out answer sheet to each child and discuss as appropriate.

Follow up exercise – **Meeting our needs worksheet**

The task is to draw arrows to connect the items. A quick look at the sheet and answers should be sufficient for teacher to see how it works.

After time doing the worksheet, hand out answer sheet and discuss.

DIFFERENTIATION

To make easier (options)

d) Hand out the items to match up in stages rather than all at once – e.g. the wildlife pictures & names, the landscape features, the times (how long ago) and the important features. This greatly simplifies the exercise.
e) New rule: each group can send a spy to one other group to see what they have done and get clues.
f) Hand out one of the answer sheets after a while, so that the students can see some of the answers.

EXTENSION ACTIVITIES

Make list of as many animals or plants that live in and around the local area (including Flashes, mosslands, rivers & canals) as can. Then split them into which prefer to live in each of the areas. If we don't know – can we find out? How would we approach this scientifically?

These species (introduce word) could then be classified: e.g. amphibians, birds etc. Or carnivores, herbivores, etc.

Carbon Landscape Top Trumps could be downloaded and played as the information about wildlife in there complements this nicely (link below)

Students make list of everything people need. Review the lists and consider the difference between needs (really need) and preference (would like, or prefer). Discuss (or write) how stone age people vs Romans vs us meet these needs differently.

KEY DISCUSSION TOPICS & BACKGROUND

Industrial Revolution

The Industrial Revolution was the time when people started to use machines, particularly coal powered, on a huge scale instead of people making everything themselves or with the help of animals. It was the birth of factories and the modern ways of making and doing things.

The area around Carbon Landscape is where much of it really started to take off and lots of things began around here, there is lots of important local history and heritage.

Examples for feeform questions

Things invented in the Industrial Revolution examples:

- Spinning jenny (invented in Leigh)
- Synthetic dyes to colour cloth
- Trains (Liverpool and Manchester Railway was the first inter-city railway in the world)
- Photographs
- Electric lights
- Cars

Other species that live in mosslands examples:

- Bog bush cricket
- Insect eating sundew
- Dragonflies
- Cross heath
- Hare

What you might find in a canal examples:

- Kingfisher
- Water Vole
- Otter
- Water plantain
- Narrowboat

Local wildlife & Nature recovery

The Carbon Landscape is full of all kinds of animals, wildlife, and rare species. The more you explore the more you see! Sometimes wildlife hides away from people and other times it comes out and can be seen. Why?

Find local sites on the Carbon Landscape map. What is around us?

Lots of people and groups are working to help nature to recover from harm people have done in the past, and we also need to learn how to not do more harm in the future.

People's needs & affecting the landscape / environment

People everywhere have similar needs.

When we meet our needs, especially using machines and modern technology, sometimes the way we do that has negative consequences for nature and wildlife.

If we understand that, we can change the ways we meet our needs to not create the same problems.

Wetlands

These 3 areas – the Flashes, the Mosslands, the Wetland corridor – are all different types of **wetlands**.

Why are wetlands so important here and all over the world?

- Home to many many species (biodiversity)
- Help to fill lakes, ponds and rivers (slow water runoff)
- Store lots of carbon (in the soil – carbon sinks)
- Purify water (filter water going through)
- Reduce floods (absorbs water like a sponge)

LINKS - CURRICULUM

Science

Living things and their habitats

Basic needs of animals

Human impact on environments

History

History of these islands and how Britain has influenced and been influenced by wider world (Industrial Revolution)

Geography

Understanding of the interaction between physical and human processes, and of the formation and use of landscapes and environments.

FILES / DOWNLOADS

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Carbon Clever All Questions only (print one per group).pdf

Carbon Clever All Answers only (print one per person).pdf

(For extension option)

https://www.carbonlandscape.org.uk/carbon-landscapes-wildlife-top-trumps

Flashes

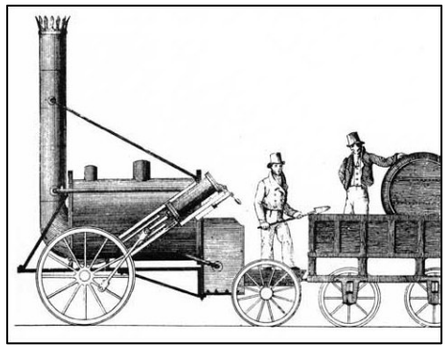
The Flashes of Wigan and Leigh were formed when the ground sank and filled with water, making lakes. Find the picture and name for *the reason why the ground sank...*

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

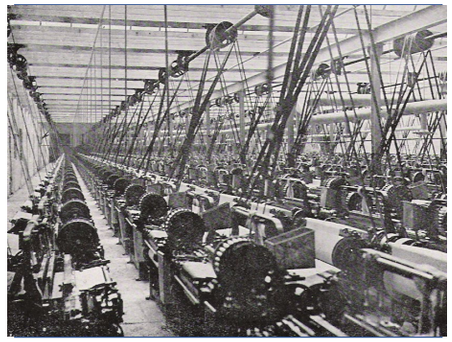
The Mersey Wetlands Corridor is the area around the river Mersey and another waterway. Find the picture and name for this other world-famous waterway

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!

MODULE 3) OUR (LIVING) EARTH: LESSON PLAN PAGE 1

OVERVIEW

Learning about the Earth as a whole so we can understand the ways people could live without harming nature and wildlife.

Total time for module: 30 – 50 minutes

FORMAT

Groups of 2-4.

NB. The pieces need preparing (printing & cutting) – this can be done with the children as part of the exercise, or prepared in advance.

LEARNING OUTCOMES FOR CHILDREN

Understanding a simple big picture of how everything cycles on Earth – how it works as a cycle or a system

Know how all of the environmental problems and challenges we face boil down to 3 fundamentally unsustainable things that people do when meeting their needs, because of *the way* wemeet our needs harms the Earth as a whole.

PREPARATION

Main exercise: **Cycles and life 'jigsaw' and quiz**
Follow up exercise – **3 ways we harm worksheet**

Print and cut the sheets and pieces
A3 is much better (but not essential) for the exercises when possible - but the answer set can be A4.

Print **one set** of everything in the Questions/exercises file **for each group**. This includes:

- 1 'jigsaw' sheet for main exercise
- 1 '3 ways we harm the' follow up worksheet

Provide 1 plain backing sheet (paper or card in the same size as printing) to stick the pieces down onto.

Print **one set** of everything in the Answers file **for each child**. This includes:

- 1 answers sheet for the main 'jigsaw' exercise
- 1 answer sheet for the follow up worksheet.

Cut the pieces out for the cycles and life 'jigsaw'.
Children can do the cutting themselves as part of the exercise if appropriate.

When possible, children can use paper glue to stick the pieces down onto the backing sheets during the exercise. This can be more satisfying (though not required) – and it also means the work will stay intact at the end so no need to take a photo if wish to keep the work done after the activity is finished.

ACTIVITIES

Main exercise - **Cycles and life 'jigsaw' and quiz**

1. Hand out the pieces of the jigsaw
2. The task is to put the jigsaw together (on to the plain backing sheet)
3. Once the pieces are in the right places, they can be stuck down, but encourage the children to wait until they have figured out where everything goes so they can change their minds!
4. Once complete, fill in the missing words on the jigsaw.
5. When ready, hand out answer sheet to each child and discuss as appropriate.

Follow up exercise – **3 ways we harm worksheet**

The task is simply to tick the boxes. All of the examples of harming nature and wildlife can be classified into one of the 3 categories. These categories have been introduced already through video with Professor Jigget. The simple descriptions on the worksheet itself should also be sufficient for everyone to understand the distinctions.

After time doing the worksheet, hand out answer sheet and discuss.

DIFFERENTIATION

To make easier:

A list of the answer words could be provided on screen or paper so the task is simplified to just find out where they go.

On the 3 ways we harm worksheet – one answer could be given for each of the three sections to provide more of an initial pointer

EXTENSION ACTIVITIES

In the middle of the diagram it shows 'inputs' into our cities and towns from nature, and then 'outputs' from people to nature. Make a list of as many of these inputs and outputs as you can think of. Explicitly introduce the vocabulary of 'system'.

Classify these outputs (stuff that people put into nature) as natural (biodegradable) or human-made (synthetic). Which ones could the mushrooms and decomposers eat, and which ones would give them indigestion?

See if the groups can come up with some other examples of each of the 3 ways – physical damage, poison and overwhelm.

Discuss – which of these ways causes Climate Change? (See discussion background following)

MODULE 3) OUR (LIVING) EARTH: LESSON PLAN PAGE 2

KEY DISCUSSION TOPICS & BACKGROUND

Cycle of Life on Earth

We live in a big system, powered by sunlight and made possible by plants that can eat sunlight for food. Everything cycles around again and again.

When we throw things 'away' – they stay within this system.

Just like one house is part of a street, and one street might be part of a town or city – a town or city is part of a bigger system on planet Earth, and we affect it through what we do and make to meet our needs

Inputs and Outputs

Thinking about inputs and outputs is a very accessible way to start seeing patterns and understanding complex things. You can think about what goes into and comes out of a person, or an animal, or a house, a school, a city.

Where does it come from? And where does it go? And where does it belong? Simple questions forming the foundations for much future thinking and study!

The 3 ways people harm nature & wildlife

All the environmental problems can seem really complicated but thinking about inputs and outputs can help make it simpler.

Poison is about stuff we put into nature that is harmful in itself, like CFCs in air conditioners, fridges and aerosols.

Overwhelm is about stuff that is fine in itself but we put out too much too fast for nature to cope with easily, like Carbon dioxide and methane

And the third way is just simple damage – like deforestation or paving ove natural spaces (not about inputs or outputs.)

Climate Change

Climate change is driven by all three of the ways we harm!

Burning fossil fuels generates the excess Carbon (CO_2) that is often seen as the problem.

But there are also other gasses from factories or household appliances that contribute to the problem (which are 'poison' because they are not biodegradable naturally occurring substances).

And finally – chopping down or destroying ecosystems (e.g. cutting down rainforests) reduces the capacity for the Carbon to be taken out of the atmosphere by trees and plants who breathe it in!

LINKS - CURRICULUM

Science

How living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals

The requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow)

Human impact on environments

Observe naturally occurring patterns and relationships.

Everyday materials - learning how to evaluate the sustainability of a material (Does it belong in the natural cycle? Or - Is its use putting the cycles of nature out of balance?)

FILES / DOWNLOADS

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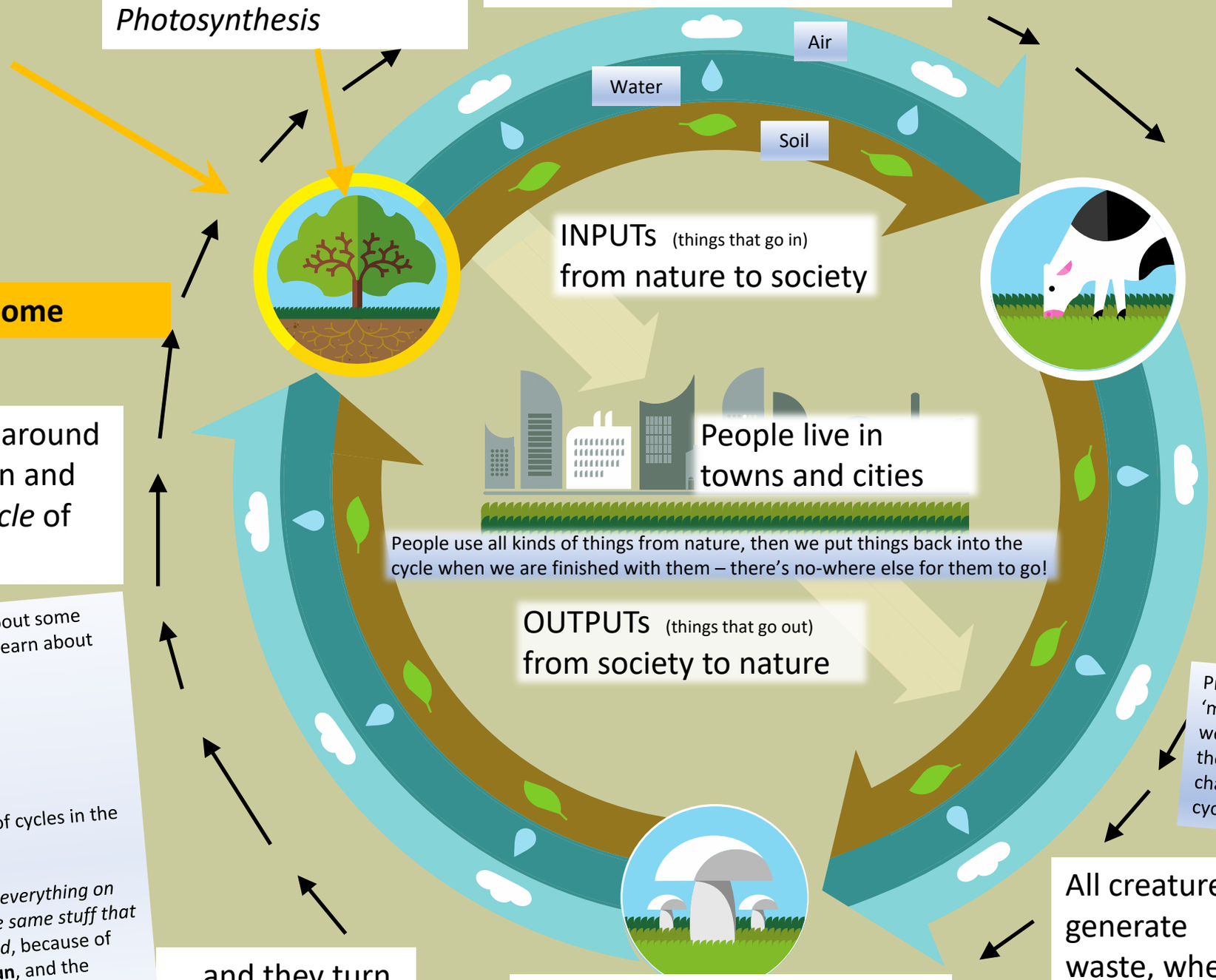
Carbon Clever All Answers only (print one per person).pdf

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)

All creatures generate waste, when they *Poo*.

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.

... and eventually, everything *dies*.

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.

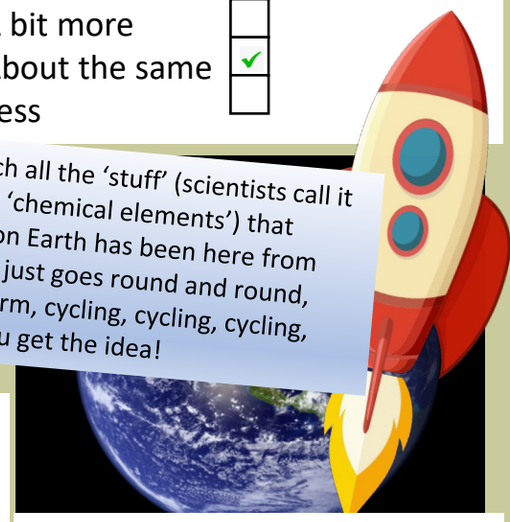
E.g.
The Water Cycle
The Carbon Cycle
The Nitrogen Cycle
(There are lots and lots of cycles in the world!)

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!

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!

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	

MODULE 4) OUR (BRIGHT) FUTURE: LESSON PLAN PAGE 1

OVERVIEW

Learning how we could live in ways that don't harm. Simple guidelines and practical examples, with opportunity for students to consider their own creative involvement.

Total time for module: 40 – 70 minutes

FORMAT

Groups of 2-4.

NB. The pieces need preparing (printing & cutting) – this can be done with the children as part of the exercise, or prepared in advance.

LEARNING OUTCOMES FOR CHILDREN

Know a simple set of guidelines for how humans could live in a fully sustainable way.

See practical examples of what this might look like, including both personal and social changes.

Structured visioning of a positive future and the children's own potential roles & contribution.

PREPARATION

Worksheet exercise – **Simple Sustainability worksheet**
Main exercise – **Actions for Change Matching Game**
Final worksheet exercise – **Your Creative Future worksheet**

Print and cut the sheets and pieces
A3 is much better (but not essential) for the exercises when possible - but the answer set can be A4.

Print **one set** of everything in the Questions/exercises file **for each group**. This includes:

- 1 Simple Sustainability worksheet
- 1 Action grid backing sheet
- 1 sheet of words (actions) to cut for the actions matching game

Print **one set** of everything in the Answers file **for each child**. This includes:

- 1 answers sheet for the Simple Sustainability worksheet.
- 1 answer sheet for the Actions for Change Matching Game
- 1 final Your Creative Future Worksheet

Cut the pieces out for the Actions for Change Matching Game. Children can do the cutting themselves as part of the exercise if appropriate.

When possible, children can use paper glue to stick the pieces down onto the backing sheets during the exercise. This can be more satisfying (though not required) – and it also means the work will stay intact at the end so no need to take a photo if wish to keep the work done after the activity is finished.

ACTIVITIES

Worksheet exercise – **Simple sustainability**

The task is simply connect the lines between the problem on the left and the positive opposite solution on the right.

After time doing the worksheet, hand out answer sheet and discuss briefly. This flows forward into the next exercise.

Main exercise - **Actions for Change Matching Game**

1) Hand out the backing grid and the words to match to each group.
2) The task is to place the words onto the grid in the right place. For each action the group must figure out 1) the column - what is it about? Which of the aspects of sustainability is this about (from the positive matching just done previously), and 2) the row – what is it an example of? (Is it the old unsustainable ways, or actions for making change, or a 'system upgrade', which would be a big change that needs everyone to work together to achieve). This should be clear from a look at the answers sheet!
3) The words can be stuck down, but encourage the children to wait until they have figured out where everything goes first - so they can change their minds!
4) When ready, hand out answer sheet to each child and discuss as appropriate.

Follow up exercise – **Your Creative Future worksheet**

Freeform space for individual thinking and creativity. Asking the students to imagine a positive future, first, and then think about what their role might be.

DIFFERENTIATION

To make easier:

For each of the categories on the grid, there are two examples. It could be simplified by giving out the answer to one of them in each case, so the task becomes to find only the second example in each place, given the first to refer to.

Alternatively, the exercise could be broken down by 'column' – so all of the answers for each column are grouped and worked with one at a time. Then the task is simplified to making the distinction between 'system upgrade', 'making change' and 'business as usual' for each aspect.

EXTENSION ACTIVITIES

Can you think of a third example for each place on the grid?

KEY DISCUSSION TOPICS & BACKGROUND

Guidelines for sustainability

The 3 positive guidelines can be used to help everybody figure out what we need to do to create a really sustainable future – where we don't harm nature and wildlife by the way we live.

Changing direction

Lots of what people now know to do to help the environment is about reducing the harm.

For example, turning lights of to use less fossil fuels, or using less plastic bags.

That is *great* to do and be aware of. But we can go a step further. How can we live in a way that doesn't cause harm in the first place, rather than just trying to reduce the harm?

Because this requires very big changes, too big for any of us to do on our own, we sometimes call this 'system upgrade' and everyone needs to help with this big challenge.

Health & Wellbeing for everyone

The three guidelines we learned about in the Positive Solutions exercise are all about how to live without harming nature & wildlife.

There is another really important thing to consider – we need to make sure that we don't harm people either!

When we live in a way that is good for nature & wildlife, *and* good for *all* people, then we will really have a bright future!

Everybody's role

Everyone has opportunity to help be part of a positive change.

For example - everyone buys things – that's a huge opportunity to help by choosing carefully.

Perhaps we could create new habitats for insects and plant trees in our schools?

There are lots of places in our local landscape to visit and support for fun and ideas.

Many jobs and careers either can help directly or indirectly (e.g. a scientist or inventor learning from nature, or working with animals, or simply helping to spread the word!)

LINKS - CURRICULUM

Science

Explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.

The properties of materials that make them suitable or unsuitable for particular purposes (in relation to sustainability)

FILES / DOWNLOADS

All resources are included in the following two files:

Carbon Clever All Questions only (print one per group).pdf

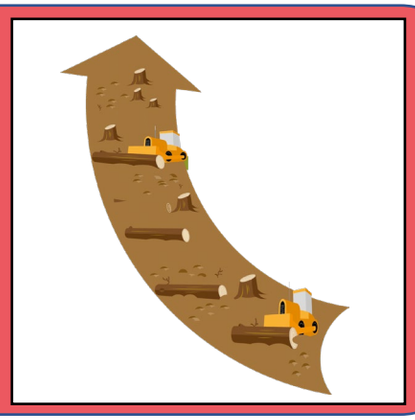
Carbon Clever All Answers only (print one per person).pdf

Carbon Clever Your Creative Future final worksheet (print one per person).pdf

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.

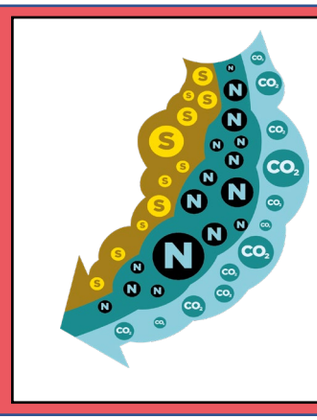
Unsustainable

Physically damage nature & wildlife (ecosystems)



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

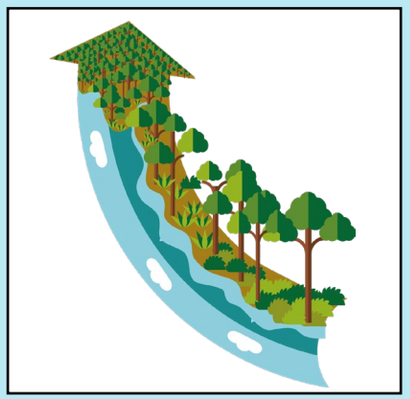
Overwhelm (too much too fast) with natural stuff like CO2 from fossil fuels



Sustainable

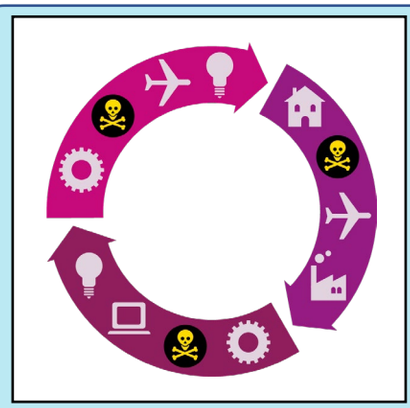
Balance flows of natural stuff

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

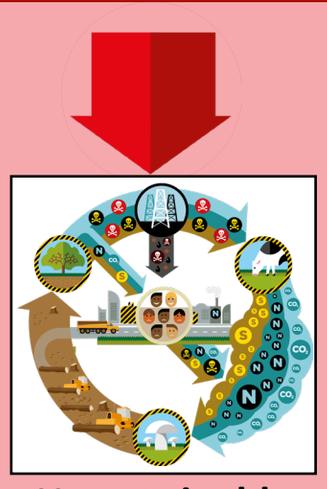
Nature

People

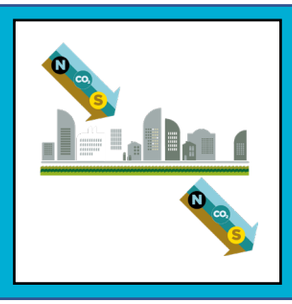
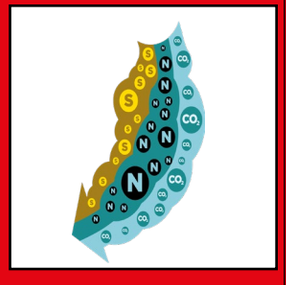
SYSTEM UPGRAGDE
New ways that don't cause the problems

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** 

Now it's time for you to get CREATIVE

Draw or write in the box below – what do **you** think will it be like in the **FUTURE** when we have learned how to live in a way that is good for nature, wildlife **and** people?

What might **you** like to do to help, either soon or when you are grown up?