



Jane
Goodall
Institute

Learning Resource



Planet in Crisis

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DP WORLD

Planet in Crisis



SCAN ME

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Climate change is about more than a change in weather patterns. As climates change the creatures that live in them also have to adapt, move on or die. The climate crisis and biodiversity loss are closely linked – Planet Earth is in crisis!

In this activity you and your students will:

- ▶ learn about biodiversity and how it is affected by climate change.
- ▶ Discover why having a highly biodiverse planet is good for humans.
- ▶ Think about ways to encourage biodiversity in their local area.
- ▶ Either start a rewilding project in their local area or campaign for renewable energy sources to fight climate change ... or both!

What do I need to make it work?

- ▶ Access to the internet.
- ▶ Permission to rewild a local area. This may be within the school grounds or elsewhere.
- ▶ Poster making materials for a renewable energy campaign.

What is Biodiversity?

Biodiversity is all the living things on the earth, from the smallest creepy crawly to the largest whale. Biodiversity also includes different species and how they interact with each other and their environment.

When you look at the area around you, the amount of different plants and animals you can find tells you how much biodiversity there is.



Photo by Klub Boks: <https://www.pexels.com/photo/bird-perched-on-a-stem-12678017/>

Discuss

1. What locations would you expect to be low in biodiversity?
2. Where would you go locally to find higher biodiversity?
3. What are the differences between those places?
4. What factors would cause biodiversity to increase or decrease?

Take a look

As a mini activity let's take a look at a few locations in your local area to see what biodiversity is like.

- ▶ Choose 2 or 3 locations nearby to investigate. Keep the areas fairly small, like a pile of leaves or a flower bed or the corner of a playground.
- ▶ Grab a pen and some paper, maybe a digital camera and visit the locations and note down all the plants and animals you can find. If you don't know what things are, then take a picture or do a drawing and identify it later. Look closely, many living things are very small!
- ▶ To help see how biodiverse the areas are that you looked at, you can put the plants and creatures you found into different groups. Here are some helpful charts – *you can make this as simple or as scientific as you would like to!*
 - ▶ Animal kingdom: bit.ly/46aOAZp
 - ▶ Plant kingdom: bit.ly/45f6r6M
- ▶ Talk about the differences in each area you went to and what biodiversity you found there. Which area had the highest biodiversity and which had the lowest?

What is Climate Change?

When we talk about climate change, we refer to the long-term shift in temperature and weather patterns around the world. Climate change happens naturally over extremely long periods, but in the last 200 years the rate of climate change has increased dramatically due to the actions of people.

Temperature vs Solar Activity

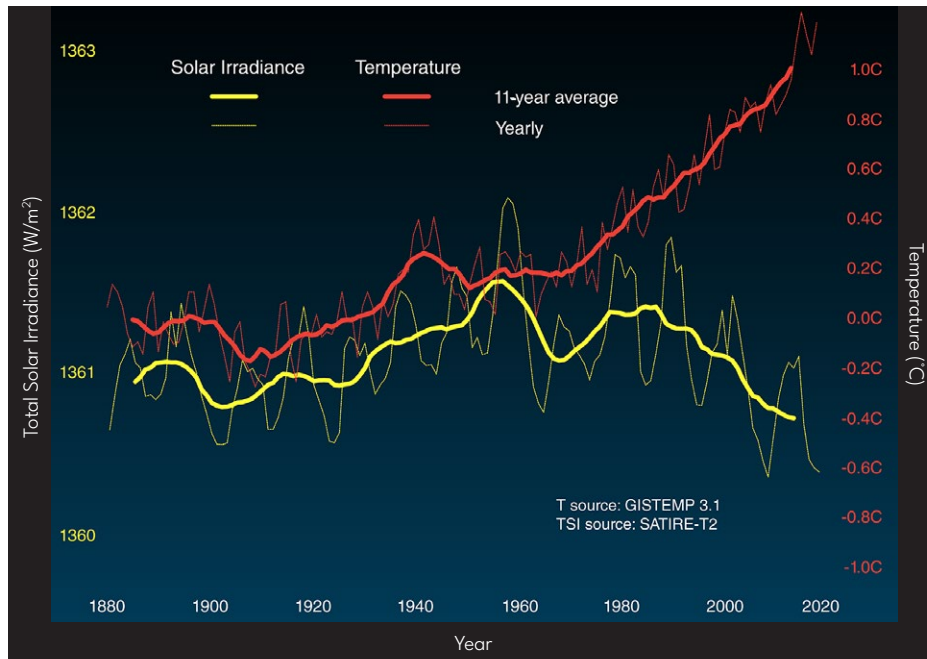


Chart from NASA: [tinyurl.com/yx5wxd7](https://www.nasa.gov/content/images/2015/11/20150916_1360.jpg)

This website shows how average global temperatures have changed over the last 1000 years:

<https://www.temperaturerecord.org/>.

- ▶ On average, have global temperatures decreased or increased?
- ▶ What factors have you heard about that cause global temperatures to change?

Natural Climate factors

- ▶ **Volcanic eruptions:** large clouds of volcanic ash and sulphate aerosols cause short-term cooling as they reflect the sunlight – these typically fall to the ground in a few months. Volcanoes also emit carbon dioxide, a greenhouse gas. This can add a warming effect in the atmosphere.
- ▶ **Ocean currents:** These are a major part of the climate system for circulating heat energy from the sun around the globe and regulating weather patterns and air temperatures. You can find out more in our *Warm seas, cold seas, ocean currents* resource: bit.ly/ocean-currents
- ▶ **The Earth's orbit:** As the earth orbits the sun, it 'wobbles' very slowly in a variety of ways. These 'wobbles' affect the amount of the sun's energy that reaches the Earth, which can affect climate – these changes are called 'Milankovitch cycles'. You can see a short video of the different types of 'wobble' here: youtu.be/_tkZZVB3_VQ
- ▶ **Solar variations:** The sun is the earth's source of energy. As the amount of energy sent from the sun changes our climate will change too.

As you can see from the chart above, this 'solar irradiance' has dropped since 1980, but global temperatures have continued to rise. This points to a man-made problem.

Man-made causes to climate change

- ▶ **Greenhouse gas emitting fuels:** People have been burning things to cook and to keep warm since prehistory, and since the 1700s people have been busy inventing powered machines too. The vast majority of these machines, whether for transport, or for manufacturing goods or food, burn fuels to run, particularly 'fossil fuels' such as oil or gas. All of these burnt fuels (whether they are 'fossil fuels' or 'renewable fuels' such as wood or biogas) release greenhouse gases when used, which helps to trap heat in the Earth's atmosphere.
- ▶ **Destruction of nature:** To find materials or to make space for the food and products we use today large chunks of natural habitats like forests have been destroyed. Areas like forests are one of our biggest defences against the buildup of greenhouse gases like carbon dioxide as plants can split this into carbon and oxygen using a process called photosynthesis. They store the carbon in the form of plant material such as wood and release the oxygen back into the atmosphere.
- ▶ **Over-consumption:** People are wasteful and greedy. We buy more than we need and throw away what we don't use, all adding to global pollution. A large chunk of global greenhouse gas emissions are linked to private households. Our lifestyles have a profound impact on our planet.
- ▶ Can you think of any more ways we have a bad impact on climate change?

Climate change and biodiversity

Plants and animals have evolved to survive within specific conditions. They can withstand a certain range of temperatures and some require seasons to govern breeding and migration patterns.



Wildfire in the jungle. Pixabay, Creative Commons CCO

This range of conditions is called the “**species climate envelope**” – if they are in that envelope, they will do well. If climate changes are outside of that envelope, then they will need to adapt again.

Global temperatures are likely to rise by an average of more than 1.5°C within the next 20 years. Compared to the extremely slow climate changes caused by Milankovitch cycles and solar variations, this is a very sudden and serious shock for many species and will either force them to adapt, or push them towards extinction.

Climate changes biodiversity

- ▶ **Species move on:** If temperatures rise beyond the species envelope, creatures who can will try to move somewhere else. This can cause a change in the new ecosystem and invasive species can have devastating impacts of native species. Read about the Asian hornets that are moving into the UK: bit.ly/46ezRDp.
- ▶ **Species that can't move:** Plants don't have legs or wings, so have to stay put and become at risk of being locally extinct. This reduces genetic diversity and makes species more vulnerable to pests and diseases. This can lead to crops failing, food shortages and even famine.

- ▶ **Extreme weather:** Along with rising temperatures comes melting ice and changing ocean currents, causing extreme weather events like hurricanes and flooding. As well as putting many people out of their homes, this also destroys habitats and ecosystems in its path.

Here are 9 species (out of many) affected by climate change on the WWF website: bit.ly/3RlwlYe

Biodiversity changes climate

The loss of biodiverse habitats only makes the problem worse. We have incredible ecosystems, from trees to soils to peatlands, that suck carbon out of the air! If we lose them then we only speed up climate change.

- ▶ Read more about carbon sinks on Wikipedia: bit.ly/48vNaBf

Discuss

Using the information above and any research your group can do, think about these questions:

1. If global temperatures keep rising, what will happen to biodiversity?
2. If biodiversity decreases, how might this affect climate change?
3. Can you think of ways we can help to slow climate change or support biodiversity (or both?)

Options for action

The planet is facing a crisis of biodiversity loss and climate change and we must act now. Here are some options to start doing something to help support biodiversity and slow climate change.

Get rewilding



Photo by Kristina Paukshtite: <https://www.pexels.com/photo/blue-white-and-red-poppy-flower-field-712876/>

Perhaps using one of the areas you surveyed for biodiversity earlier in this resource, think about changes you can make to that location to encourage biodiversity. Here are some important steps to rewilding:

- ▶ **Do nothing!** Don't rush in and cut or plant things. Spend a few months or even a full year watching the area without touching it. Nature has a habit of showing you what's best if you wait.
- ▶ **Do some research.** While you are watching, learn more about the area. What type of habitat is it, and what did it used to be? What creatures might you expect to find, but are missing? What plants or habitats could you introduce to encourage them into that area?
- ▶ **Make a plan.** You need to determine and plan the interventions that will help restore the missing ecosystem processes and kick-start rewilding and let nature get back on its feet. Did there used to be a water source there? Maybe you could introduce a small pond: bit.ly/48vOjRz
- ▶ Keep watch. Every few months, do another biodiversity survey to build up a picture of what's happening in your rewilding project.

Choose a few things to focus your efforts into and plan what you would like to achieve. Think of ways to get more people onboard and involved. Maybe start with some information posters to get people thinking about renewable energy or how they can use less fossil fuels in their day.

Campaign for emissions-free renewable energy



Photo by Pixabay: <https://www.pexels.com/photo/alternative-alternative-energy-clouds-eco-energy-433308/>

Reducing our reliance on greenhouse gas emitting fuels is a key way to fight climate change. How can you encourage your family, your school, your town or your country to work towards using more emissions-free renewable energy?

At home

- ▶ Research energy supplies. Which suppliers focus on green energy, can you encourage your family to switch?
- ▶ Do an energy audit to see where you can reduce your energy usage tinyurl.com/4j2xruu7

At school

- ▶ How do most people get to school? How might you persuade them to walk or cycle instead of drive? Can they lift share?
- ▶ Are there ways your school can save energy?

Your town

- ▶ Write to your local representatives expressing your concern over fossil fuels and pollution and encourage them to introduce renewables where possible.

Your country

- ▶ Write to your local national representative and encourage them to do more for renewable energy.

Want to help improve this activity?

This activity is a living document! Help us by editing this activity to make it as good as possible, just use this short link (just type it into your web browser's address bar): bit.ly/3RFyVne – full instructions are provided. Any edits that can make this resource easier to use in the classroom are very welcome, so please follow the link and make your contribution!



SCAN ME

JGI & DP World

The Jane Goodall Institute has partnered with DP World to support the growth of the Roots & Shoots programme. DP World are a leading provider of worldwide smart end-to-end supply chain logistics with a presence in 55 countries, enabling the flow of trade across the globe. This exciting partnership supports the creation of resources on the wider marine ecosystem as well as supporting the expansion of Roots & Shoots groups around the world. **Find out more:** bit.ly/jgi-dpw

Tell us how you got on

When your project is finished we'd love to see what you did! If you already have an account you can upload a story with images to the Jane Goodall's Roots & Shoots UAE website (find us at www.rootsnshoots.ae) to show off pictures and videos of your ships to a wider audience. If your school or youth group does not already have an account then just fill in the form on the website and we can set you up.

UAE Year of Sustainability

2023 is the Year of Sustainability in the UAE where we ask the question how can we be sustainable as a **community**, with our **nature**, and our **resources**? Through knowledge-sharing and storytelling, together we can spread essential information about sustainability and its importance, so share your work as wide as you can and tag/mention the campaign on Instagram, Facebook, Twitter, YouTube and TikTok with the account @UAEYearOf and the hashtags #UAE52 and #TodayForTomorrow. Learn more at UAEYearOf.ae.

Keep up to date with Jane Goodall's Roots & Shoots UAE

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