Science Biodiversity Activity - you will complete this by doing a science walk of your own in your own neighborhood or finca. Read the instructions and complete the charts.

You will be expected to turn in images as well to be a part of the art mosaic.

Physics Zipline Activity

You will watch the following video on the Physics of Zipling
https://www.youtube.com/watch?v=kOpAPPIjhYM&t=175s

Answer the following questions:
1. What forces are at work on a zipline?
2. Do heavier people travel faster? How and why?
3. What would make a zipline move faster?
4. Are there any health benefits to ziplining?
5. What are the physics behind the idea of a zipline? What is actually happening?

Promotional Language Video
You will be required to complete the video on your own. Pick three tourist ideas for Colombia that you can promote from where you are. Do one in English, one in French, and one in Spanish. It should be a 3-5 minute video.

Math Golf
Read the attached STEM News as it relates to golf. Be ready to tell at least 10 interesting facts you found out about golf and math.

Science Biodiversity Activity

Vocabulary

- **Biodiversity:** all of the different kinds of life you will find in one area, including animals, plants, fungi, bacteria, habitats, ecosystems, and genetic material
- **Ecosystem:** the living (plants, animals, other organisms) and nonliving (air, water, soil) components of an area that interact with each other in an interconnected way
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter

It's important to periodically evaluate an area's biodiversity because our health ultimately depends on it. We rely on nature for food, water, air, materials, and regulating the climate and other processes of our planet. If an area has rich biodiversity, it indicates that the environment is in good condition. The more species and ecosystems existing in an area, the more contributors are working together, making the system stronger and helping nature to thrive. If biodiversity is low, the stability of the system weakens and all that depend on it will be affected. The following are various criteria scientists examine when performing these assessments to effectively evaluate a region's biodiversity:

– **Composition (the number of different types of species/habitats found in the area) – Abundance (how many individuals of each species there are)**
– **Distribution (how spread out the individuals/habitats are)**
– **Extinction risk (how many species from the area are threatened or endangered)**

Location: Where Found	**Composition: What Found**	**Abundance # of individual species observed**	**Distribution: How spread out are the speicies**

If you were to give this area a biodiversity grade, what would it be? Why?

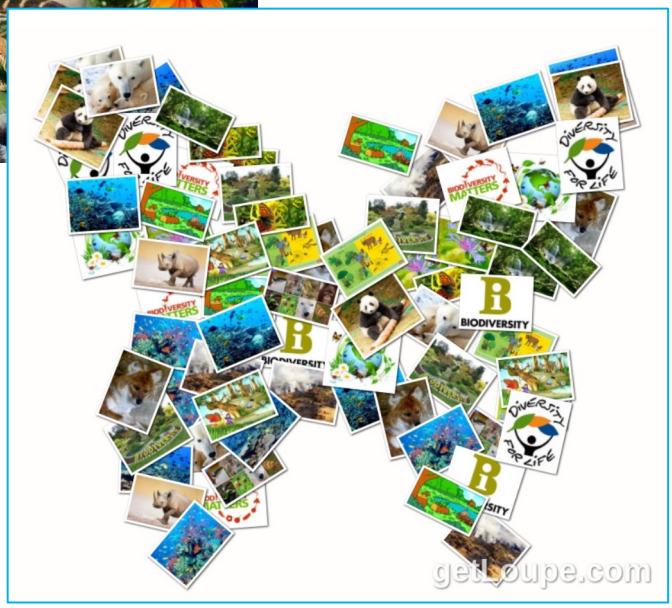
What could be done to increase the area's biodiversity?

Science Biodiversity Activity: Art Mosaic

Activity: Using your phones or cameras, take pictures of things in nature you see on the nature walk that reflect the definition of biodiversity. (See examples below)
Think about the definition to be sure that your pictures accurately represent the biodiversity of the area. When you return to class, you will put all the images together on paper and create one large class project. Tape the mosaic together and display it in the room or hallway.

Does the group mosaic adequately depict biodiversity?

Why is biodiversity is important?
– Every plant/animal/bacteria/genetic makeup/habitat is a thread in the "web of life." The more threads there are, the stronger the web. However, as threads are removed, the web becomes weaker and eventually falls apart. Biodiversity is the framework for nature, which provides all the things we need to survive. Without biodiversity, there is no nature. And without nature, there is no humanity. In nature, everything is connected. The ripple effect of any change touches every part of our planet. Have students select one component found in the artwork and reflect on how its disappearance would affect other components.
Biodiversity across our planet has declined dramatically. Human activity has caused populations of fish, birds, mammals, amphibians, and reptiles to fall by 60% over the past 50 years. In order to reverse this trend and bring about real change, we have to work together. This includes action at every level—governments, companies, communities, and individuals.

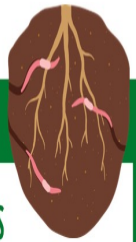


WHY DOES IT MATTER?

Our living planet operates as a living system, resulting in the conditions for life that have allowed humans and other species to thrive; clean air, fresh water, a breathable atmosphere and the conditions needed to grow food. The huge diversity of species is a very important part of this system. The planet cannot work in the same way if the amount of wildlife and wild spaces is reduced, or when the movement of wildlife or the flow of natural processes is disrupted.

MOVEMENT OF WILDLIFE

Animals may need to migrate long distances across grasslands, across oceans, or down and up rivers, to survive seasonal changes and complete their life cycles. Where human activities prevent this happening the survival of that population can be threatened, and ecosystems that depend on their movement are also disrupted. Other species need large areas to forage or hunt enough food, and if a landscape is crossed by a road or railway they can struggle, even if the total amount of habitat is not significantly reduced. This is known as 'fragmentation'. For example, tigers need huge hunting grounds, but forests in which they live and hunt are often fragmented by roads, causing problems.



NATURAL PROCESSES

Examples of important natural processes include the water cycle and soil production.

Freshwater systems can be disrupted by dams that block rivers, the over-use of water in homes and on farms, and the loss of trees that would usually slow the rate that rainwater reaches the ground.

Healthy soil is created by a complex ecosystem that includes microscopic bacteria, insects, fungi, and earthworms. Just one handful of soil can contain more living organisms than there are people living on Earth. When working properly, these natural processes break down dead matter such as leaves, and ensure that the soil is rich in nutrients and oxygen. However pesticides used for farming can damage this soil ecosystem, while deforestation can lead to a lack of plant matter to make new soil, and exposed soil with no roots to hold it together being washed away by rain.

BIODIVERSITY

is the term used to refer to all the different living things found in an ecosystem. When an ecosystem has a lot of biodiversity it is usually more resilient to change or problems, because there are so many connections and relationships that each living thing is more likely to find another way to cope if one of these is lost or damaged.[1]

NATURE IN DECLINE

The Living Planet Index shows that wildlife populations studied around the world have, on average, declined by 69%, and this trend is not yet slowing down. Some have declined by much more – including many freshwater populations. This decline in wildlife and wild places is mostly due to human activities such as deforestation, large-scale farming, pollution, and construction of buildings and transport networks. Such activities prevent the living system from working as we need it to in order to provide for the needs of the growing human population. The LPI is one of many different indicators that confirm that biodiversity is declining.

On a LPI graph showing the change in biodiversity on our planet, the line has dropped steadily since 1970, and animal populations continue to decline. It is essential that we take the actions needed to change this trend and 'bend the curve' of biodiversity loss. This means not only stopping it from declining, but making changes that allow it to recover, so that the line on our graph slopes upwards and biodiversity increases to the levels we had in the past. This will not be easy, but if we act quickly, and with an understanding of the way different parts of the living system depend on each other, we can start to make the world wild again, and therefore healthier and more resilient.

In the last few decades human activities have destroyed forests, grasslands, wetlands and other important ecosystems all around the world, threatening human well-being as well as wildlife. **This is an unsustainable way for us to live on this planet.**

BIODIVERSITY INTACTNESS INDEX

Scientists are now monitoring how much overall biodiversity remains in different areas of the globe compared to what once existed there. This is called the Biodiversity Intactness Index (BII). If an area's BII drops below 90% it starts to function less well, causing problems for the wildlife and people who depend on that landscape. If the BII falls to 30% or less there is so little biodiversity left that the ecosystem could be at risk of collapse. The BII of Canada is 89%, suggesting that the scale of nature loss could start to affect the healthy functioning of the ecosystem. For the UK, the BII is already down to 50%.

SUSTAINABLE DEVELOPMENT

is defined by the United Nations as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. In other words we must not keep taking more from the natural world than the planet can naturally replace, or we leave it damaged and less able to supply for our needs and the needs of others now and in the future.

TRANSFORMING OUR RELATIONSHIP WITH OUR PLANET

...TO A HEALTHY LIVING PLANET THAT WORKS FOR...

FROM THIS...

CLIMATE CHANGE

The Earth has warmed by 1.2oC since pre-industrial times, and current human activity and political pledges will fail to prevent it warming more than 2oC. Beyond 1.5oC global warming will cause huge problems for people and nature.[2]

POLLUTION

300-400 million tonnes of pollution are dumped into freshwater ecosystems every year[3].

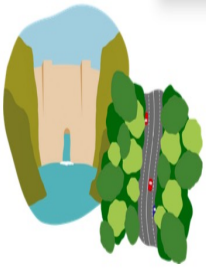
Ocean plastic pollution has increased by ten times since 1980, and now affects more than 267 species – including 86% of marine turtles[4].

HABITAT LOSS

75% of the Earth's ice-free land surface has been changed by humans, mainly to create farmland for food production. 90% of wetland area has been lost globally. About 100,000 sq km of forest is lost per year, or roughly one football pitch every two seconds[5].

WILDLIFE EXTINCTIONS

1 million species are threatened with extinction in the coming decades[6].



HABITAT FRAGMENTATION

Natural processes are becoming disrupted as habitats in land, sea and freshwater are fragmented.

WILDLIFE & CLIMATE DATA

NATURE

Connections between protected and restored habitats worldwide allow movement of wildlife species and the flow of natural processes.

PEOPLE

Fair, just management of natural resources to ensure everyone has access to healthy food and a stable environment.

Conservation led and informed by Indigenous Peoples.

Communities most affected by climate change nature loss are involved in decisions that affect their lives, and supported to adapt.

CLIMATE

Global carbon emissions cut through a shift to renewable energy and sustainable practices. Global warming limited to 1.5 degrees.

DID YOU KNOW?

In 2021 the United Nations Human Rights Council declared that everyone, everywhere, has the right to live in a clean, healthy and sustainable environment.