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BioSustainED: Teacher Capacity Building in Biodiversity
Project No 2023-2-LV01-KA210-SCH-000

TRAINING MATERIAL (PART III)

Training programme for teachers in-service "Holistic approach for biodiversity teaching in general secondary education in Latvia or gymnasium in Lithuania (grades 10-12)"

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**Erasmus+ Small-scale Partnerships project “BioSustainED: Teacher Capacity Building in Biodiversity”
Project No 2023-2-LV01-KA210-SCH-000170510**

Partnership:

Natural Research and Environmental Education Centre (Latvia)

Miško Briedžio mokykla, MB (Lithuania)

Project activity: Development of teacher training programme and training material.

The Content

I. Promoting positive thinking in society by breaking false stereotypes and forming positive attitudes towards natural objects that have negative public perception.

II. The Importance of Biodiversity for Healthy Human and Forest Ecosystems: a Fungal Perspective.

You can download the materials developed during project: LV



LT





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BIOsustainED

Teacher Capacity Building in Biodiversity

Promoting positive thinking in society by breaking false stereotypes and forming positive attitudes towards natural objects that have negative public perception.

Maksims Balalaikins

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https://www.shutterstock.com/search/confrontation-students?image_type=illustration

Society has different views on all topics. Teachers need to develop a positive and correct view of what happens in nature and the role of people in it.



<https://harshakmemory.com/learning-something-for-once-but-forever/>

Children's worldviews are shaped in the family, but it is through children that the teacher can shape their parents' worldviews.



<https://www.rmk.ee/the-million-why-s-of-forestry/forest-management>

At first glance, this forest seems like a beautiful, pleasant place. But in fact it is a commercial forest that is very poor in biodiversity.



<https://www.istockphoto.com/photo/suserup-forest-in-denmark-gm630018534-112278009>

This is what a biodiverse forest should look like, and we need to help children discover its beauty



A natural forest is a habitat for a wide variety of living organisms, much of which is provided by dead wood.



<https://www.trees.org.uk/News-Blog/Latest-News/The-value-of-tree-and-shrub-species-to-wildlife>

This is what a biologically valuable tree should look like, and it should be allowed to exist for as long as possible.



<https://www.daba.gov.lv/en/biologically-valuable-tree>

A hollow tree is habitat for bats, rodents, birds, insects and other invertebrates, mosses, lichens and other organisms.



https://www.freepik.com/premium-ai-image/toadstools-fairies-enchanting-creatures-evoke-magical-forest-spring_146751113.htm

When we think of fungi, we most likely picture poisonous or edible mushrooms.



<https://orionmagazine.org/article/fungus-mushrooms-peter-wohleben-book/>



<https://www.shutterstock.com/image-photo/photo-orange-mushroom-including-rare-species-2260303691>



<https://fineartamerica.com/shop/framed+prints/jelly+fungus>



<https://www.alamy.com/mycocalicium-subtile-known-as-slag-pin-lichen-tiny-lichenicolous-fungus-from-finland-image541495619.html>

In fact, the world of fungi and the diversity of species in general is much wider than we realise.



<https://www.facebook.com/photo.php?fbid=3117778018258529&id=811654302204257&set=a.953756641327355>



https://www.cerambyx.uochb.cz/cerambyx_cerdo.php

Whether we view insects as pests that can affect our economy, or whether we realise that many wood-feeding insects are an important aspect of biodiversity and help maintain natural processes in forests.



<https://stagbeetles.ptes.org/about-stag-beetles/>

Your first thought when you see these larvae is, are they May beetle larvae? They're actually larvae of the stag beetle. Which is probably extinct in Latvia and Lithuania. But if we saw them, would we realise what they are?



<https://ptes.org/campaigns/stag-beetles-2/stag-beetle-facts/male-and-female-stag-beetle-by-michelle-rickards-ptes-identification/>

These are adults of the stag beetle. Although this species is probably extinct in Latvia and Lithuania, many people say they have seen this beetle. This means that despite the beetle's impressive appearance, we do not pay attention to what we see around us.



Snakes evoke fear and disgust, but how much we know about them? For example, that one of the pictures shows not a snake but a lizard. That snakes are valuable animals and many other facts? A task to prepare presentation about local snakes can be a way that we will discover about them and change our attitudes about them.



<https://www.diena.lv/raksts/latvija/zinas/novartet-putnu-gripas-bistamibu-14257331>

Do we know what and when to feed birds? Do we know that birds should not be fed bread?



<https://www.fox13seattle.com/news/two-seal-pups-die-after-being-illegally-removed-from-washington-oregon-beaches>

Do we know that baby animals should not be brought home? A solution is only required if we will discover that the mother of the baby has died. But even then we should not act on our own.



<https://www.dw.com/en/hedgehogs-threatened-by-loss-of-habitat-and-food-in-europe/a-48663491>

Do we know that hedgehogs cannot be fed cow's milk and that hedgehogs do not eat apples and mushrooms?

Red-Eared Slider



Rotans (*Perccottus glenii*), pazīstams arī kā Amūras grundulis. FOTO: COPES LIETAS

Do we know that invasive species should not be introduced to new habitats. That turtles raised in terrariums should not be released into the wild, and that amur sleepers should not be moved from one body of water to another.



https://www.dziedava.lv/daba/izveleta_daba.php?ftips1=44&fdzv=76&menesis=7



<https://www.flickr.com/photos/coleoptera-us/2918252388>

Do we know that not all ladybirds are positive, but there is an invasive species, the Asian lady beetle, whose presence we should not be happy about?



<https://www.redzet.lv/photo/kanadas-zeltslotina-kanadas-zeltgalvite-A-701-19>



<https://www.redzet.lv/photo/dzelonainais-gurkis-A-569-10>

Invasive plants are the same and should be avoided on your property. It is very bad if we take greenery from our garden into the forest, where various invasive species may subsequently appear as a result of our actions.



https://ar.m.wikipedia.org/wiki/%D9%85%D9%84%D9%81:Trash_in_forest.jpg

Litter in forests is one of the most important problems, the solution to is in the realm of public education.



<https://www.istockphoto.com/photos/littering-park>

The worst solution is litter bins without lids, which encourage people to leave their rubbish in the expectation that someone will pick it up later. In fact, the right thing to do is not to leave rubbish, but to take it with you



<https://www.dreamstime.com/photos-images/bear-garbage-can.html>

However, if a container is needed, the only solution is a lockable container that is emptied regularly without waiting for waste to start accumulating around it.



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The Importance of Biodiversity for Healthy Human and Forest Ecosystems: a Fungal Perspective.

Aurelija Plūkė

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A stylized illustration of a mushroom with a brown cap and a white stem, positioned on the left side of the slide. The stem is tall and thin, with a small brown cap at the top. A series of small brown dots trail from the stem, curving downwards and to the right, suggesting a path or a trail of spores.

The Importance of Biodiversity for Healthy Human and Forest Ecosystems: a Fungal Perspective

Aurelija Plūkė

www.grybupasaulis.lt

Why do I care about biodiversity?









Young people feel very similarly

High Levels of Concern: A significant portion of young Europeans express deep worry about climate change. A poll indicated that **70% of individuals aged 16-25 are either extremely or very worried about the climate crisis.** This concern is notably higher compared to their worries about COVID-19, highlighting the prioritization of climate issues among youth ([European Environmental Bureau, 2021](#)).

Emotional Impact: Many young people report experiencing climate anxiety, feeling overwhelmed by the challenges posed by climate change. This emotional burden can lead to feelings of hopelessness, with some believing that humanity is doomed without significant intervention ([World Economic Forum, 2022](#)).



Young people feel very similarly

Desire for Participation: Young people are eager to be involved in climate action and decision-making processes. The Council of Europe emphasizes that youth participation improves the effectiveness of climate policies. Young individuals want their voices to be heard in discussions that affect their future, advocating for the inclusion of their perspectives in policy-making (Council of Europe, 2024).

Climate Literacy: There is a recognized need for improved climate education that empowers young people with knowledge and skills to engage in climate discussions effectively. Education systems are encouraged to foster critical thinking and communication skills related to climate issues, enabling students to participate actively in public debates and advocacy efforts (Organisation for Economic Co-operation and Development (OECD), 2024).



A healthy ecosystem

Is like a well-functioning community where different plants, animals, and other organisms interact and depend on each other. There's a balance in nature, with enough variety of life to keep everything running smoothly.



FUNGI play the
key role in the
health of
ecosystems



**Lithuania and
Latvia are
mycophilic
countries**



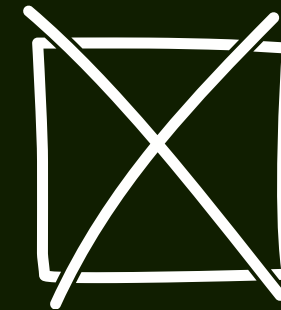
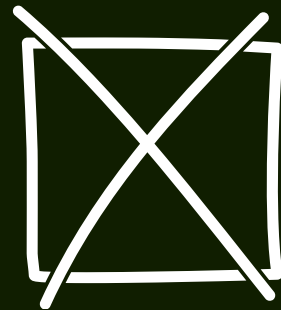
**CAN I
EAT IT ??**



What are fungi?

What are fungi?

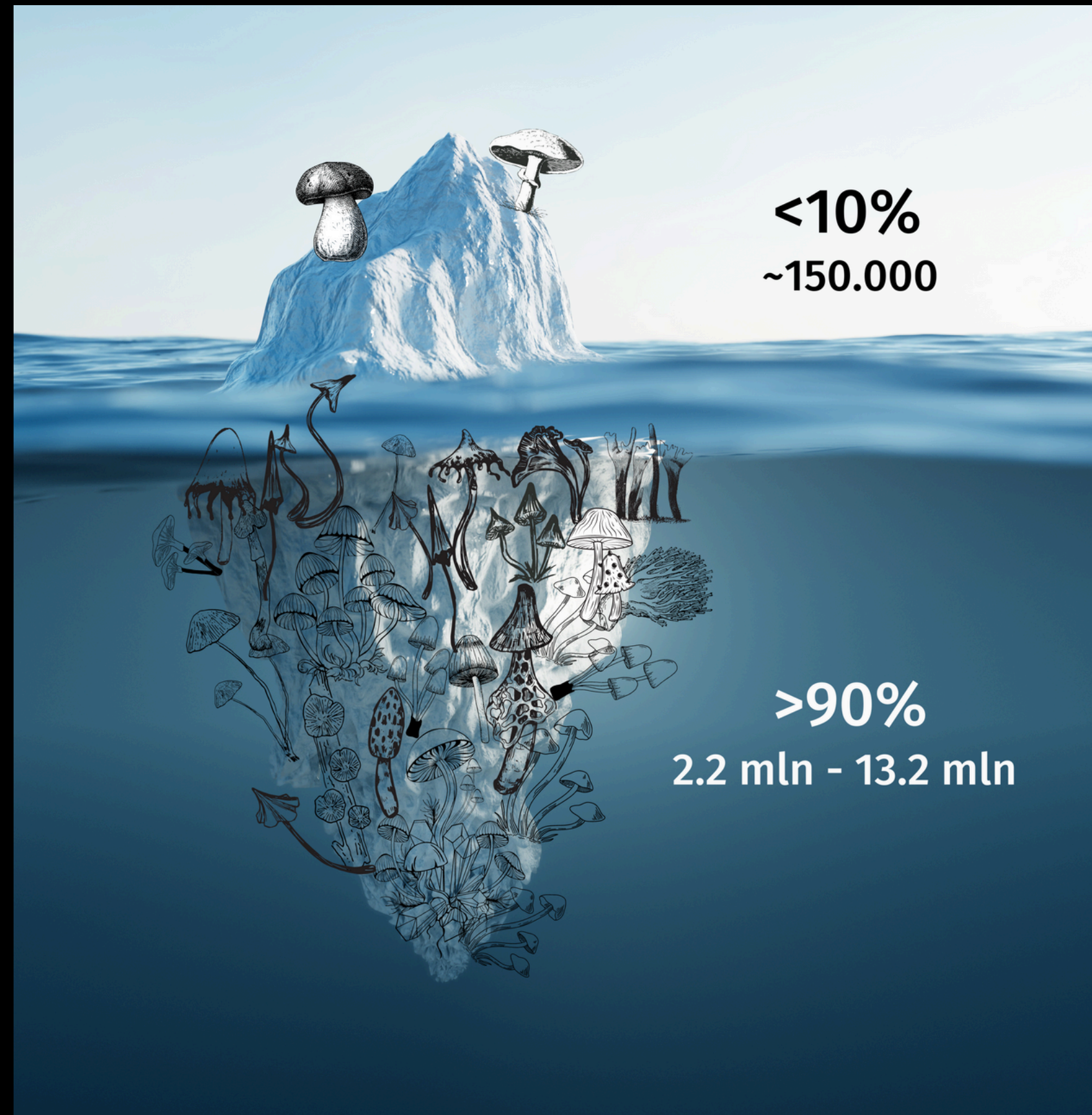
NEITHER PLANT NOR ANIMAL



What are fungi?

NEITHER PLANT NOR ANIMAL

LESS THAN 10% RESEARCHED



What are fungi?

NEITHER PLANT NOR ANIMAL

LESS THAN 10% RESEARCHED

MOSTLY UNSEEN



Which forest is more biodiverse?

Fungi - the ultimate recyclers



Fungi as decomposers: supporting forest biodiversity

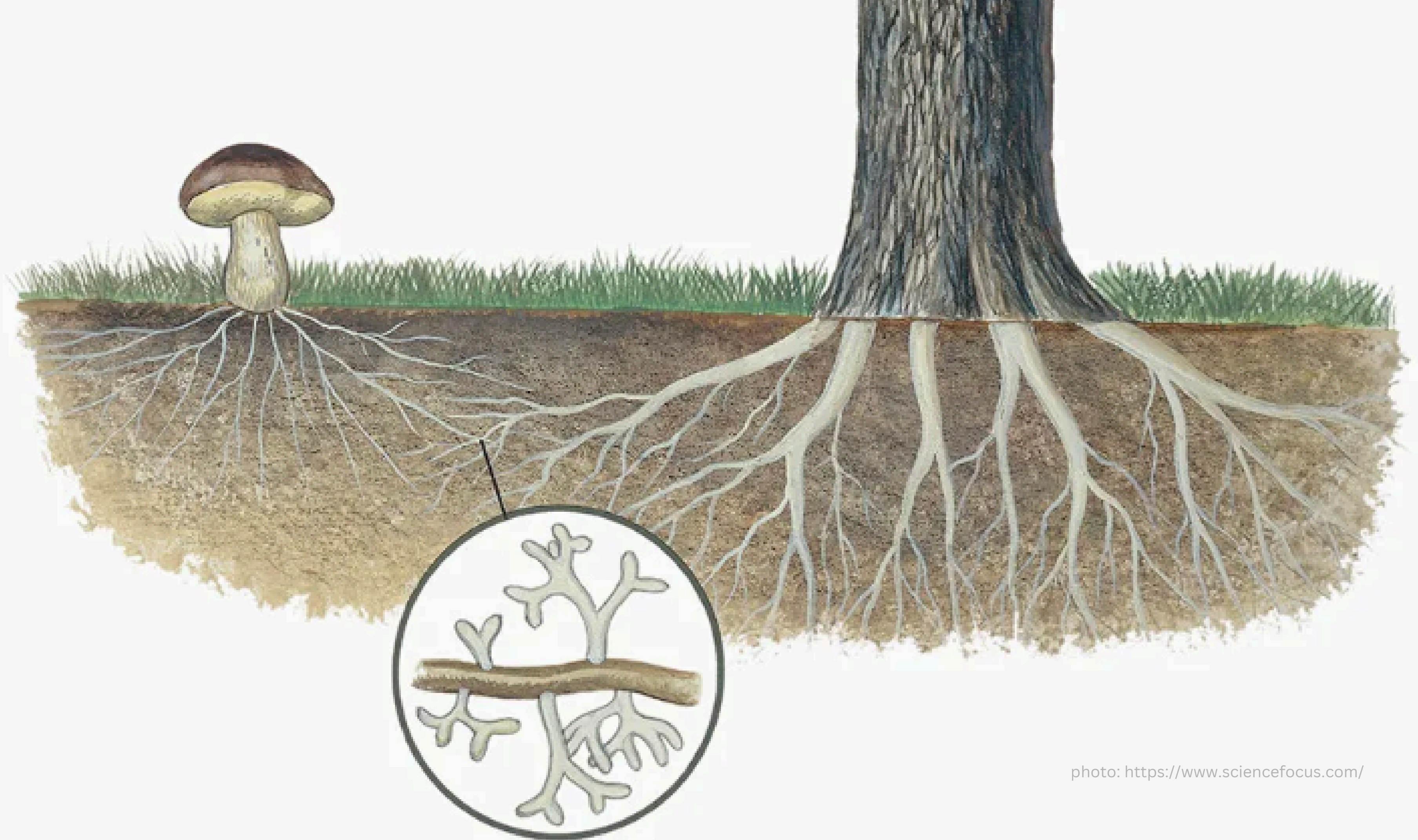
- **Recycle nutrients:** Break down dead plant and animal matter, releasing essential nutrients like nitrogen and phosphorus into the soil.
- **Reduce disease risks:** Decompose fallen trees and organic debris, limiting the spread of pathogens.
- **Create habitats:** Transform decaying material into new habitats for microorganisms, insects, and plants.



Networkers

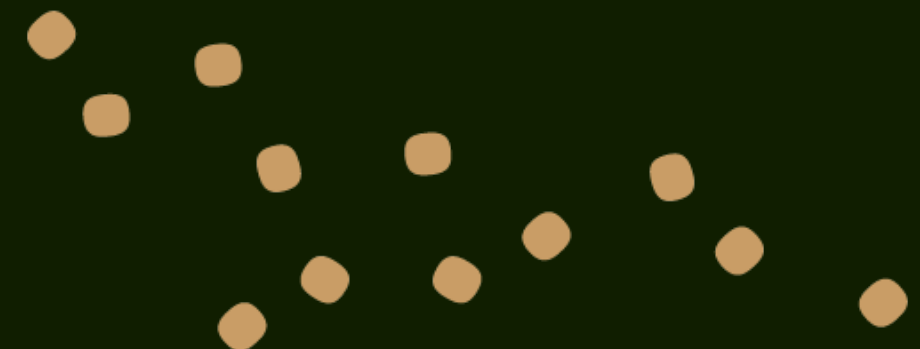


Mycorrhizal fungi



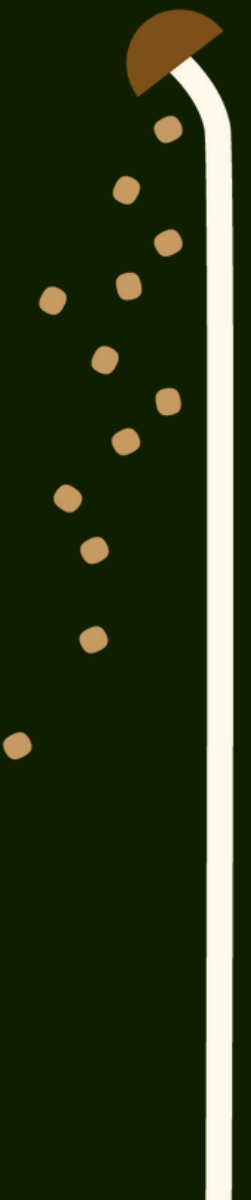
Mycorrhizal fungi's role in forest biodiversity

- **Help forests to be more resilient** by enhancing water and nutrient uptake, improving photosynthesis, boosting antioxidant defenses, and strengthening natural defenses against pests and diseases.
- **Improve soil health** by decomposing organic matter, cycling nutrients, stabilizing soil structure, preventing soil erosion, retaining moisture and fostering beneficial microorganisms.
- **Connect forest plants** by forming underground networks that link tree roots, allowing them to share water, nutrients, and information.



Ecological Balance and Conservation

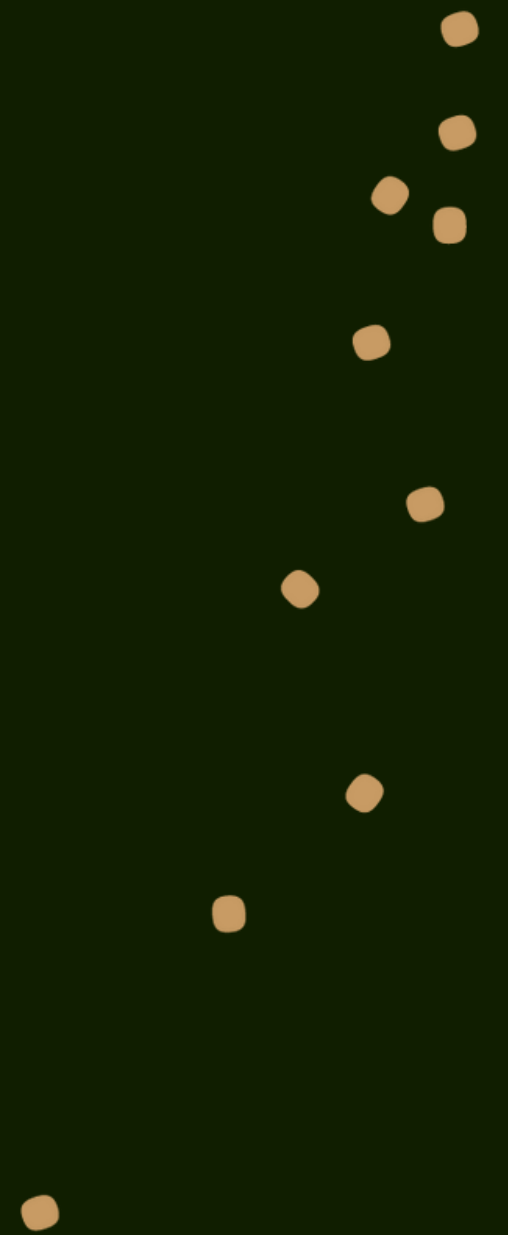
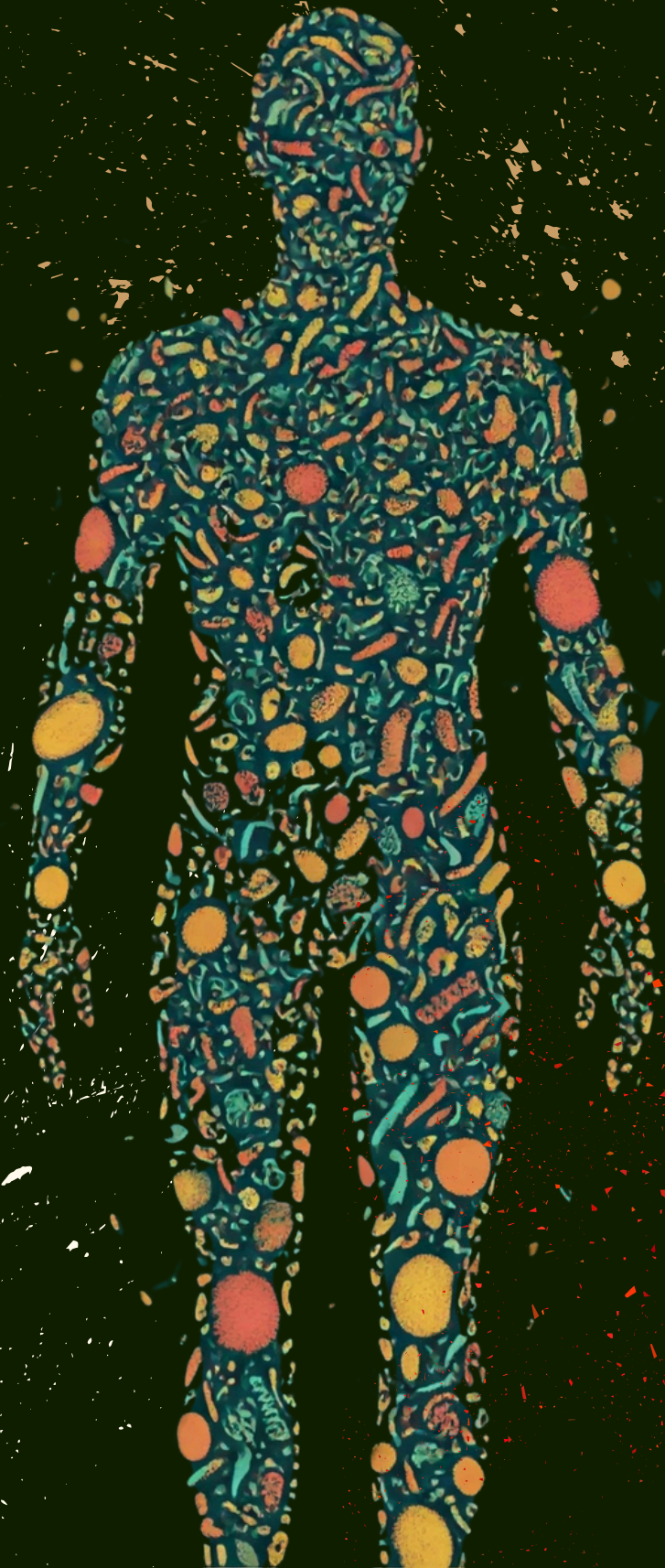
- **Regulate ecological balance:** fungi support plants through nutrient exchange, interact with bacteria to enhance nutrient cycling, and influence animal behavior as a food source or by producing repellent or attractive compounds.
- **Capture CO₂:** fungi play a critical role in sequestering carbon, capturing up to 36% of annual CO₂ emissions.
- **Detoxify environments:** break down pollutants and plastics, aiding in the restoration of contaminated ecosystems.



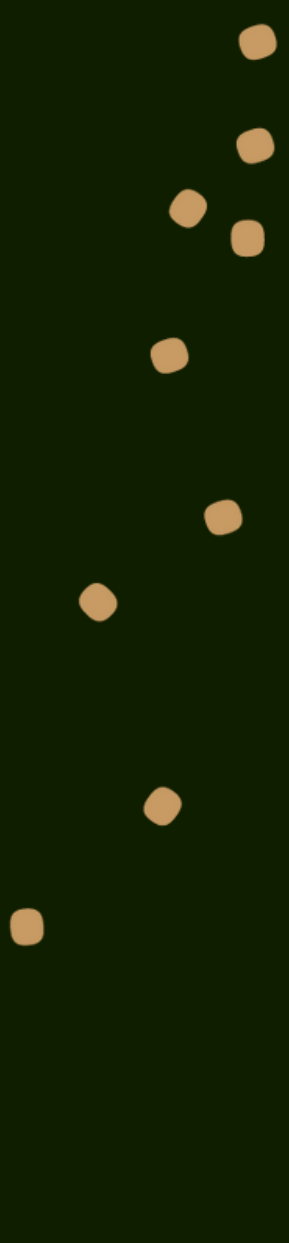




**You are an
ecosystem too**



How fungi support your inner ecosystem

- **Aid in Digestion:** Fungi, like yeasts, break down complex carbohydrates and enhance nutrient absorption, supporting gut health and a balanced microbiome.
 - **Regulate Bacteria:** Fungi help maintain microbiome balance by influencing bacterial populations, preventing harmful overgrowth.
 - **Support Immune System:** Fungi interact with the immune system to regulate inflammation and strengthen defenses against infections, particularly in the gut.
 - **Decompose Waste:** Fungi break down dead cells and organic matter, aiding tissue health and regeneration.
 - **Produce Bioactive Compounds:** Fungi create antibiotics, anti-inflammatory agents, and antioxidants, benefiting human health and advancing medicine.
- 

Biodiversity and healthy ecosystems are interconnected: one cannot thrive without the other.



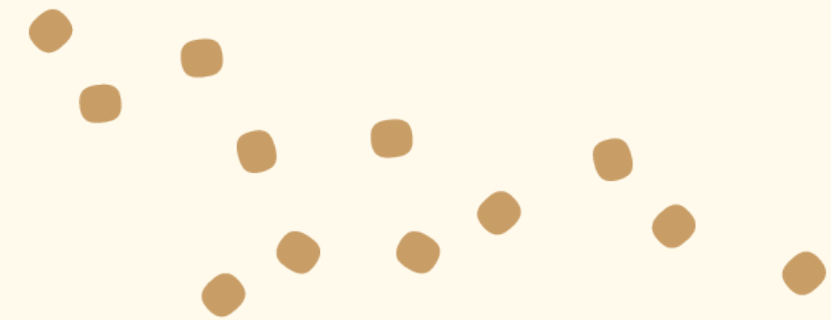
ACTIVITY: "Discovering Fungal Diversity: Seeing the Hidden World"

- **Activity Focus:** Explore and document fungal diversity using sensory observations and a "scanning" technique.
- **Key Locations:** Pine forests and old-growth forests with decaying trees.
- **Steps:**
 - Observation: Look for fungi's colors, textures, shapes, and relationships with their surroundings.
 - Documentation: Use the questionnaire to describe at least three different fungi.
 - Analysis: Compare fungi across different areas and discuss their ecological roles.



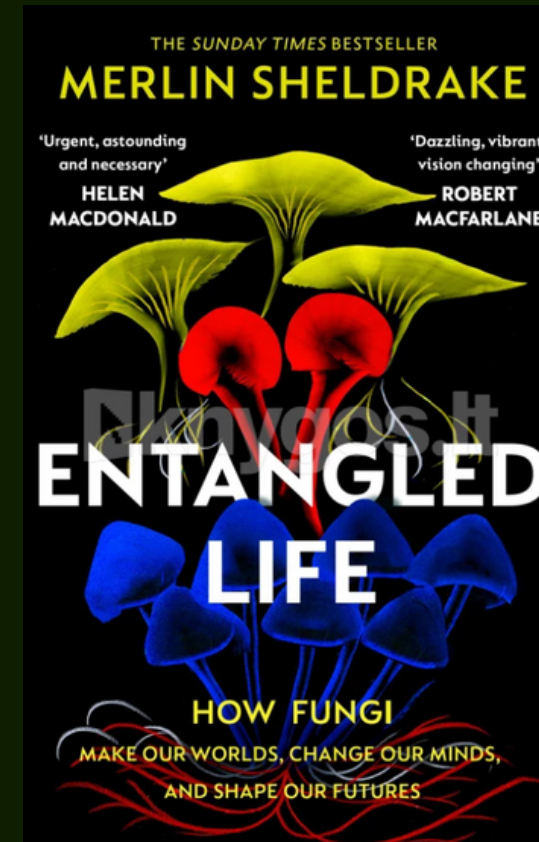
ACTIVITY: "Fungal Hackathon: Solving Climate Challenges"

- **Objective: Students** explore fungi's unique abilities and use them to solve climate-related problems.
- **Skills:** Teamwork, problem-solving, creativity, public speaking, and research.
- **Focus:** Learn fungal superpowers like decomposition, carbon sequestration, and bioremediation.
- **Key Steps:**
 - Learn: Discover fungi's capabilities and real-world applications.
 - Choose: Teams select a climate challenge (e.g., plastic waste, air pollution).
 - Create: Develop innovative, fungi-based solutions.
 - Pitch: Present ideas to peers or a panel.



To explore the world of fungi more:

- “Entangled Life: How Fungi Make Our Worlds, Change Our Minds & Shape Our Futures”, Merlin Sheldrake
- Movie “**Fantastic Fungi**” (2019, netflix)



An illustration of two mushrooms on the left side of the page. The taller one has a straight stem, while the shorter one has a curved stem. From the gills of the shorter mushroom, a trail of small brown dots representing spores falls downwards and to the right.

**Keep spreading
the spores!**

Thank you!

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Together towards to the sustainable development.