

Teacher's Guide

Natural Resources

Part 2

Based on the Karnataka State Board Curriculum for
Standard VIII



JANAAGRAHA CENTRE FOR CITIZENSHIP & DEMOCRACY

Janaagraha's initiative to improve citizen engagement in India's democracy through their civic learning program

Developed in collaboration with Young Leaders for Active Citizenship (YLAC)

Natural Resources | Teacher’s Guide (2/3) Part 2

Class VIII
 Board – CBSE
 Subject – Science
 Textbook – Science Textbook for Class VIII (Karnataka State Board)
 Chapter 1 – Natural Resources
 Number of parts – 03
 Length – 85-100 minutes (estimated, for a class of 40-45 students)
Note: Teachers may divide the lesson plan into as many periods as they see fit

Section I: What are we going to learn and why is it important

Learning Objectives:

Students will:

- Understand the importance of soil as a resource and how soil pollution is caused.
- Understand the benefits we get from forests and wildlife.

Learning Outcomes:

Students will be able to:

- Appreciate the value of resources such as soil, forests and wildlife.
- Contribute to protection of forests and wildlife through small initiatives.



Source: [Unsplash](https://unsplash.com)

Key terms

Forest	Wildlife	Extinct	Salination
Desertification	Seed Bank	Gene Bank	Weathering of rocks

Materials Needed

- One print of the diversity map for forest and ocean each for an activity on drawing diversity maps.

Section II: How are we going to learn

Opening discussion

Time: 5 minutes

- We started this chapter with a brief understanding of renewable and non-renewable natural resources. We also discussed exhaustible and inexhaustible resources.
- We finished the last lesson with a discussion on water as a resource and its importance.
- In today's class, we will talk about three resources: soil, forest, and wildlife.
- We will then wrap up with a discussion on what can be done to preserve these most valuable resources.

1. Soil

Introduction

Time: 5 minutes

- How many of us understand the importance of soil? I mean it is just mud on the ground right? Why do you need to care about it at all? (Expected answer: Because trees grow in soil).
- Soil may seem to be an unimportant resource but it is actually the source of all nutrition for plants. It is also the home to countless animals, insects and organisms that live in an earthly habitat.
- For us humans, the quality of soil will directly impact the quality of our crops and the quality of food available to us.

Activity: Understanding daily activities that impact soil

Time: 10 minutes

Facilitation notes:

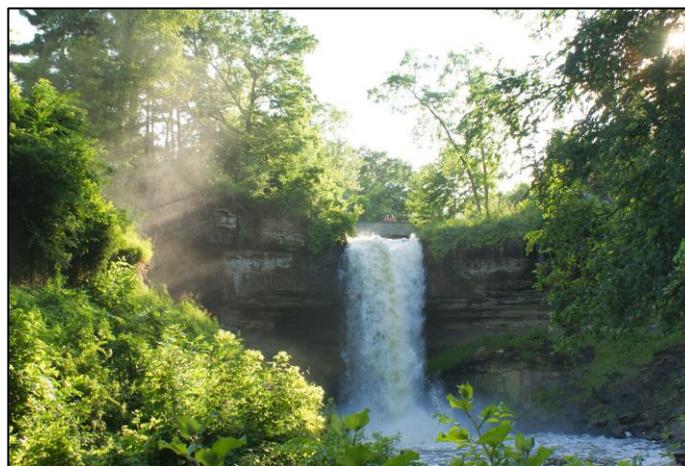
- The activity is very easy to understand.
- Everyone close their eyes. No one open them till I ask you to.
- I am going to say a few lines. If you agree with those lines/ have done what I am saying, then I want you to quietly get up in your own benches. Keep your eyes closed all this while.
- (Say the following statements clearly in class):
 - I have thrown empty chips packets in the park.
 - I have gotten angry when my mom asks me to water the plants and watered them too much.
 - I have unnecessarily plucked leaves/ flowers from plants.
 - I have disposed of soapy water, chemicals from the lab etc. on the side of a tree in the lawn.
 - Sitting in the park, I often pluck grass on the ground.

- Everyone who is standing/ sitting to stay as is and open your eyes. (most of the class would be standing up)

Debrief:

- The purpose of this activity was for students to realise how seemingly harmless things that we do causes soil pollution.
- All of us have been responsible for causing damage to soil in some way or the other.
- If soil gets damaged beyond repair, then plants cannot grow in it neither can insects and mica-organisms live in it. Our lives are heavily dependent on the quality of nature around and soil is an integral part of it.
- In the past few decades, excessive deforestation has resulted in the fertile top layer of soil getting eroded as loose soil tends to get carried away with winds.
- Soil formation happens over years due to the **weathering of rocks**- it is a process through which rocks break down into smaller pieces due to effects of sunlight, pressure, heat, and rivers. These rocks become finer and finer until they forma top layer of soil. Erosion takes place much quicker. Once the top layer of soil gets eroded, restoring its quality becomes very difficult.
- In addition, over irrigation of soil increases the salt content in soil making it unfit for growing crops. All this has led to land becoming barren and useless. This process is known as **desertification**. Punjab, for instance, is facing severe loss in soil quality due to excess irrigation.
- Apart from this, the use of chemical fertilizers has also been a serious cause of soil pollution. The use of pesticides to protect our agricultural crops has also been adding to this problem.

2. Forest



Source: [Unsplash](#)

Introduction to forests

Time: 5 minutes

Facilitation Notes:

- After discussing about soil, we will now talk about one of the most important natural resource in the world- forests.
- From our last lesson, who can tell me if forests are renewable or non-renewable natural resources? (renewable).
- So why do I need to worry about them at all? (This is because, it is easier to destroy forests than replenishing them).
- If I were to start counting the number of benefits humans and animals get from forests, then we will pretty much have only this one conversation today.
- Food, medicines, honey, oxygen, timber, rubber, a balanced water cycle etc.- forests have a role to play in everything.
- Before we talk about the importance of forests and how human beings have impacted it, I want you all to open your notebooks and write something for me.

Activity: Today I woke up to no forests in the world

Time: 10-15 minutes

Facilitation Notes:

- I want everyone to write this statement in their notebooks 'Today, I woke up to no forests in the world'.
- Under this I want everyone to write 5 points on what you think will happen if one day all the forests in the world die.
- Take 10 minutes and try and think as out of the box as possible.
- (After 10 minutes) I want a few students to share a few points with me.
- Here is a list that I prepared (write this on the board)
- Today I woke up to no forests in the world and:
 - The air was polluted and it was hard to breathe.
 - There was no timber to make furniture.
 - There was no rubber to make tyres for vehicles
 - Half of the medicines were not available.
 - Most animal species had become **extinct**.
 - There was no precipitation from trees so rainfall was irregular.
 - Soil erosion was everywhere since the trees did not hold the soil with their roots.
 - There were no fruits or vegetables.

(Pause for 2 minutes for students to note down and understand the importance of forests)

Debrief:

- The existence and health of forests don't just impact us but also the survival of countless plants and animals around the world.
- Forests are being cut at an alarming rate. It is now estimated that only 20% of the world's original forests remain intact and undestroyed.
- Human damage due to deforestation for construction, farming, roads etc. has created immense pressure on forests.
- If something is not done to protect forests, then the amount of damage that will occur will be irreparable. (The teacher can also talk about the Chipko movement. An article on the same is given in the additional resources)

3. Wildlife



Source: [Unsplash](https://unsplash.com)

The term wild life is used to describe the species of plants and animals found in the forest. It represents the diversity of organisms inhabiting our forests, seas and oceans. Let's understand this through an activity.

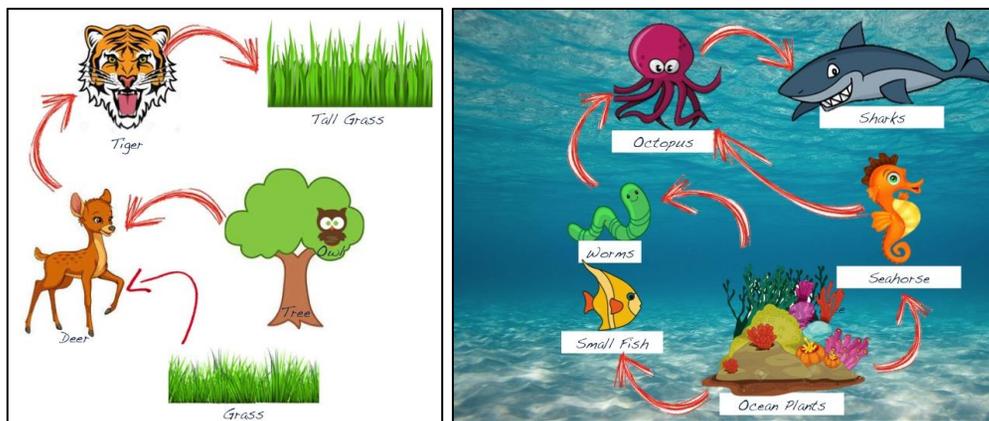
Activity: Drawing diversity maps

Time: 15-20 minutes

Materials needed: One print out of the sample diversity map for forest and ocean each (printable version in the appendix).

Facilitation Notes:

- Before we start talking about this section, I want someone to tell me what is India's national animal? (Tiger)
- What is India's national bird? (Peacock)
- Aren't both of them beautiful!
- Before we start this activity, I want you to pick a side. You have two options.
- (show the two sheets to the students) **Oceans or forests**- depending on what you like more- pick either of the two.
- Now once you decide, I want you to start thinking of everything you know that exists in the habitat of your choice- think of the plants, the animals, birds, fishes, corals, shells, trees etc.
- I want you to then think how each of these beings connect with each other. For example, for forest, I can think of deer. Deer eats leaves from trees and grass, the tiger eats the deer. At the same time, on the tree, an owl lives. Tigers also hide in the tall grass when they are hunting their prey. Start writing these down and connect them to one another. You can also draw small drawings to make it look interesting. Something like this (the teacher shows the diversity maps for forest and ocean wild life as an example to give them an idea of how to go about the activity. Students can make these connections in their notebook.)



- As you keep thinking more, connections will keep coming up. Think of as many animals as possible.
- All the people in the ocean group will do the same. Let's call these diversity maps.
- Everyone takes 15 minutes and make your diversity maps for forests and oceans.
- (At the end of 15 minutes) Now in groups of 4 exchange your maps with people and see what connections did someone else make that you missed.

Why every species matters?

Time: 10 minutes

Facilitation Notes:

- The importance of trees in forests is no surprise. But let's understand why tigers are important.
- Let's say that from my original map, I remove the tigers. What will happen? (the deer will eat all the grass and leaves)
- Correct. If I kill all the tigers, the deer will eat all the grass, the giraffes will eat all the leaves, and the trees will die.
- Who all will be impacted if these trees die? Give me examples of other animals who will be impacted. (birds, cats, monkeys)
- Let's take another case. What do eagles usually eat? (rats and snakes)
- If I kill these eagles, what will happen? (there will be too many rats who'll finish off all the food in an area and then even rats won't have food)
- So if I kill the eagles, at first the rats survive but later even rats begin to die.
- In conclusion, every living being is important for the survival of the ecosystem. Even if I remove one, all other beings are put in danger.
- The importance of forest is known to all of us. However, we often underestimate how important all the wildlife is for the survival of forests.
- The teacher can then show this optional video in class:



Video: How the wolves changed the rivers

The video shows how in a forest when wolves were introduced as an experiment, the whole dying forest was reborn and the wildlife of the forest changes significantly.

Link: [YouTube](#)

Debrief:

- We need to understand that every species is an integral part of the ecosystem. Losing even one of them will gravely impact other species including us.
- Human activity has led to a sharp decline in population of many animals and led to the extinction of many others.
- Hunting, poaching, deforestation, and habitat loss- all these activities done by humans have led to many animals being in danger. In fact, our national

animal- the tiger is also an endangered species.

- Animals are also killed for their valuable body parts, like the tiger’s skin, elephant tusks, alligator skins. They are used to make medicines and products.
- In the last 100 years, nearly 500 animal species have gone extinct ([source](#)). We need to take measures urgently to be able to address this problem.
- Efforts are being made to conserve the living resources through their maintenance in their natural habitats. National parks, wild life sanctuaries, bird sanctuaries are examples of such conservation measures.
- Sometimes, conservation of living resources involves measures wherein sample populations are protected in zoos, botanical gardens and other man made situations.
- It may also involve the creation of seed banks, gene banks and similar genetic resource. A **gene bank** is a place where DNA and cells of various living beings are stored so that in the future they can be used to scientifically produce more of those organisms. This is largely done to protect animals that are at risk of extinction. Similarly, **seed banks** store seeds of rare varieties of plants that can be used to reproduce these plants in the future.

4. Preserving resources

Time: 15-20 minutes

Note to the teacher: Since this activity involves a simple table, the teacher can draw it on the board and students can make it in their notebooks.

Facilitation Notes:

- We have spent this lesson and a few lessons before this talking about the value that resources bring to us and how everything in the world is interconnected and balanced. Each time this balance gets disturbed, multiple species get impacted.
- But the question then is, sitting here in our homes and schools, what can we really do to protect nature and animals?
- I want everyone to now discuss with their partners and fill the following table. (give students 10 minutes to think).

What can I do to protect?				
Trees in my neighborhood	Forests in far off areas	Animals around me	Wildlife around the world	Soil in my surroundings
				
Source: Unsplash	Source: Unsplash	Source: Unsplash	Source: Unsplash	Source: Unsplash

Solutions Sheet:

What can I do to protect?				
Trees in my neighborhood	Forests in far off areas	Animals around me	Wildlife around the world	Soil in my surroundings
<ul style="list-style-type: none"> • Water trees or plants around regularly. • Not pluck leaves unnecessarily. • Create awareness about growing trees and plants (at home). • Conducting a tree plantation drive in school and neighbourhood. 	<ul style="list-style-type: none"> • Create awareness about the ills of deforestation. • Not waste paper. • Encourage school authorities to use recycled paper. 	<ul style="list-style-type: none"> • Give extra food from home to the nearby animals. • Create awareness about not hitting them/ ill-treating them. • On Holi, create awareness about not coloring animals. • Take injured animals to the nearby vet. 	<ul style="list-style-type: none"> • Create awareness about endangered animals. • Never buy things made from animal skin. • Discourage elders from using items made from animal skin. 	<ul style="list-style-type: none"> • Not throw waste on the ground. • Not dispose of soapy water in the open. • Keep parks clean. • Plant trees and plants in the nearby parks. • Create awareness about the importance of afforestation.

Section III: Assessment

Time: 10 minutes

Class Quiz

Select the right answer

- a. One of the following does not belong to the group
 - water
 - forests

- petrol
 - soil
- b. Government has banned hunting of wild animals. This helps to
- maintain biodiversity b.
 - promote tourism etc.
 - provide food to animals
 - maintain soil fertility

Fill in the blanks

1. If there is rise in water table, soil becomes _____.
2. Soil provides _____ and _____ to terrestrial plants.

True or False

- Since forests are a renewable natural resources, there is no need to worry about their depletion.

Questions:

1. What would happen to a forest if all the carnivorous (animals that eat meat/ other animals) animals go missing?
2. Mention any three products that we get from the forest?
3. Mention three ways in which we contribute to soil pollution.
4. What is the difference between endangered and extinct animals?

Homework

Write down five examples of instances when unknowingly damaged plants or animals around. Find five solutions to not do so in the future.

Group work: Conduct a tree plantation drive at your school/ neighbourhood.

It's true that every student cannot protect far away forests. However, on our own level we can all do something to help make our own neighbourhoods green.

The following is a plan through which every student can make a real difference:

- Collect a few friends to agree to conduct a tree plantation drive in your school/ neighbourhood.
- Instead of buying chips/ chocolates etc., ask everyone to save money for a week.
- Every student contributes some money. The group buys saplings from a nearby nursery.
- Plan those saplings on the ground, in pots in school/ nearby park.

- Assign responsibilities within the group- on the way to school/class every day, one/ two students check on the saplings (and water them) for a few days.

Section IV: Closure

Summary by students

- Ask students to give examples of
 - a) Activities that cause soil pollution.
 - b) Things we get from the forest.(Allow one student to give only one example each so that a larger number of students may participate.)
- Ask students to:
 - a) Mention one importance of protecting wildlife in forests and oceans.(Allow one student to give only one point each so that a larger number of students may participate.)

Recap by the teacher (additional point)

We observe March 21st as the ‘World Forest Day’.

Section V: Additional resources

Resources for students:

1. Chipko Movement
The article gives details about the movement and how people protected their community forests.
Link: [India Times](#)
2. Article: Animals driven to extinction
The article gives a list of a few animals who have been driven to extinction due to human pressures on their population.
Link: [The Telegraph](#)
3. Article: Human impact on forest
The article shows through very interesting visuals how forest patterns have changed around the world in the past few decades.
Link: [Visual Capitalist](#)

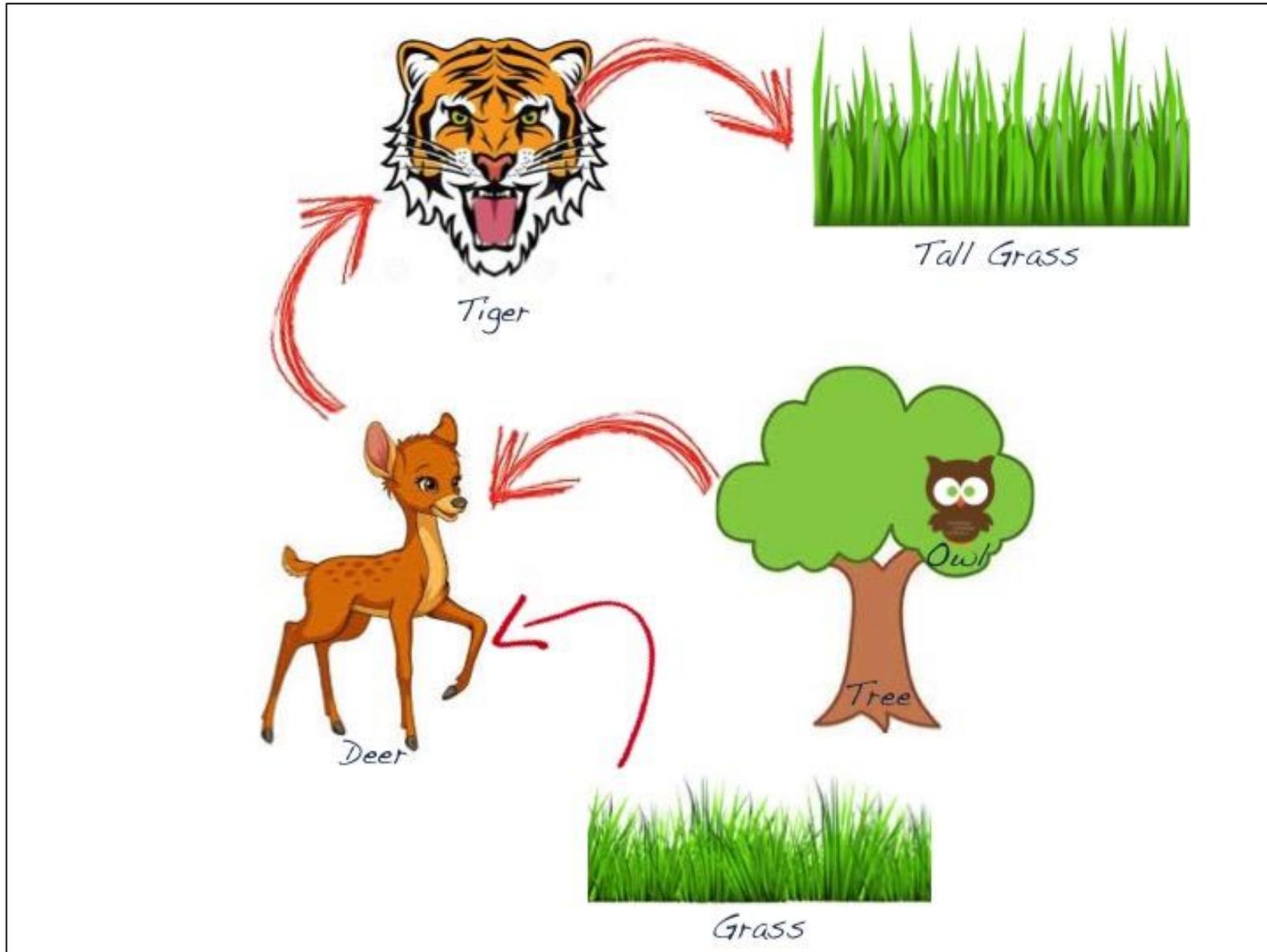


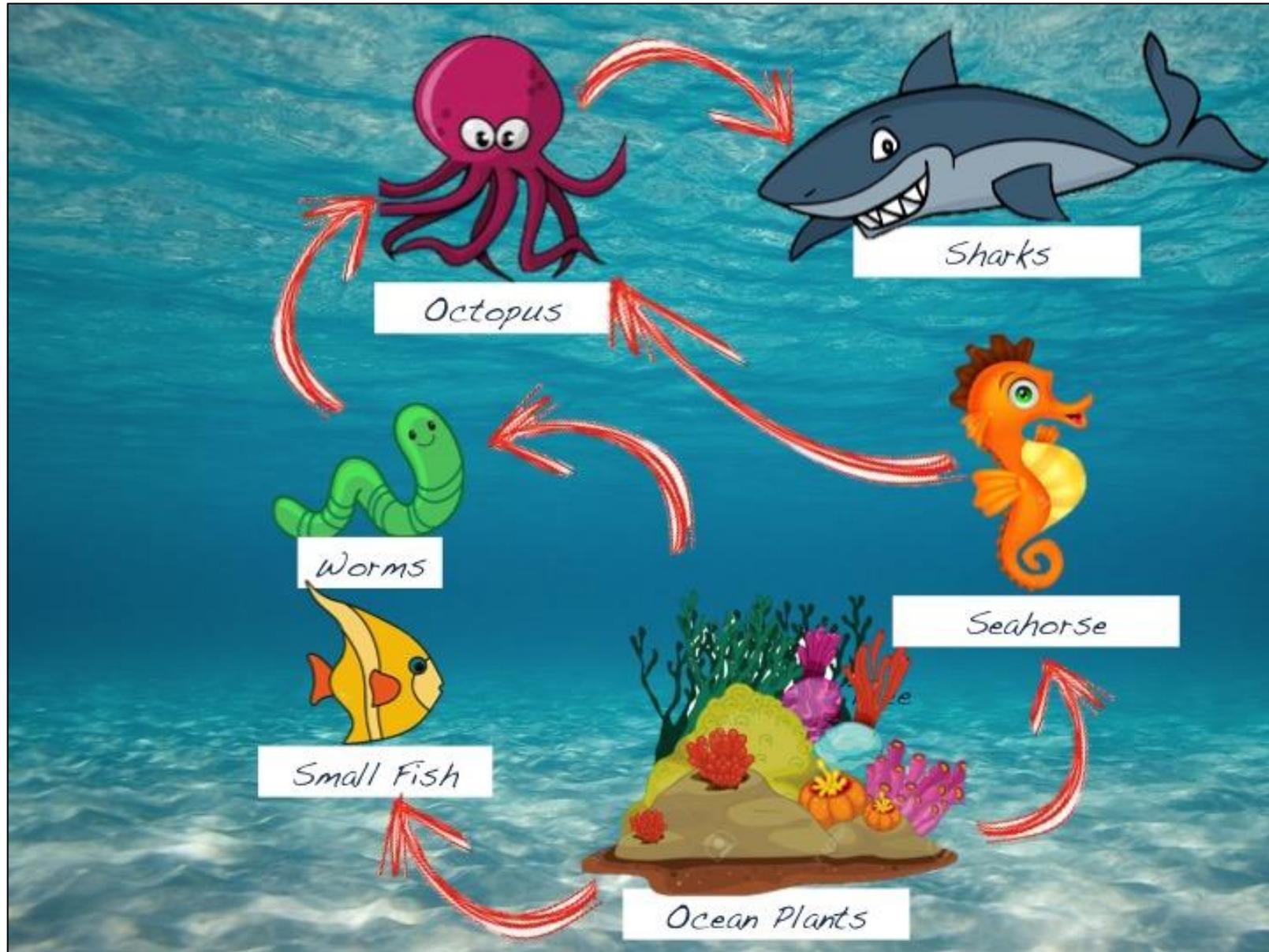
Resources for teachers:

1. Video: Why is biodiversity important?
This video explains why there is a need for biodiversity in an ecosystem.
Link: [YouTube](#)
2. Forest for kids
This is a very informative teaching guide that gives examples and activities a teacher can use to teach students about forests.
Link: [Forest for Kids](#)

Appendix

Printable version of the diversity maps for activity drawing diversity maps





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