Suggested Activities

Duration	3 hours
Recommended for	Primary 6
Subject Links	Science
Related topics in curriculum	Climate Change Impact of Man's actions on the environment Rainforest habitat and ecosystem Adaptations
Equipment/ Materials	Binoculars Digital Camera Water The book, "Our Fragile Rainforest", published by NParks

Pre-activity

Visit the link http://epa.gov/climatechange/kids/basics/index.html to read an introduction to the topic of climate change and its impact.

Activity

1. Bring students to the Central Nature Reserve (Bukit Timah Nature Reserve/ MacRitchie Reservoir), planning your routes using the book, "Our Fragile Rainforest".

2. Distribute Worksheet 1 and encourage students to take photographs of the animals they see in the rainforest. Annex 1 may be printed for pupils to bring along during the Learning Journey.

3. Students are to complete the Worksheet 1 by looking out for storyboards in the reserve. Information can also be found from the book, "Our Fragile Rainforest".

4. Gather students to discuss the outcomes of the activity, and get them to identify some of the animals they had seen in the rainforest using the book, "Our Fragile Rainforest". Use Worksheet 2 to discuss about the mushrooms that were seen in the rainforest. Talk about the parts of a mushroom, its role in the ecosystem and its mode of reproduction.
   (Note: Forest animals are rather shy and you may not get to see many of them as they may be in hiding.)

Post-activity

When back in the classroom, choose the following worksheet(s) as post-activities:

(a) Use Worksheet 3 to discuss the challenges faced by the rich biodiversity in our rainforests and the role that rainforests play in combating climate change.

(b) Use Worksheet 4 to discuss the different adaptation mechanisms the rainforest animals possess in order to survive in the habitat.

(c) Use Worksheet 5 to pen down their pledges in combating climate change or saving the rainforests. Display pledges on class notice boards.

Field Trip Record

Name: _____ ( ) Class: ____ Date : _____

Learning Journey to _____ Date : _____

Organism spotted	What group of living things does it belong to? (Plant/Animal/Fungi/Bacteria)	What community does it belong to? (Give examples)	Descriptions/information/drawings

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Reflections: _____

_____

_____

_____

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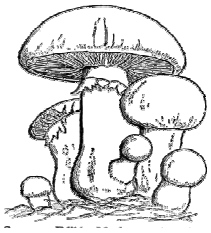
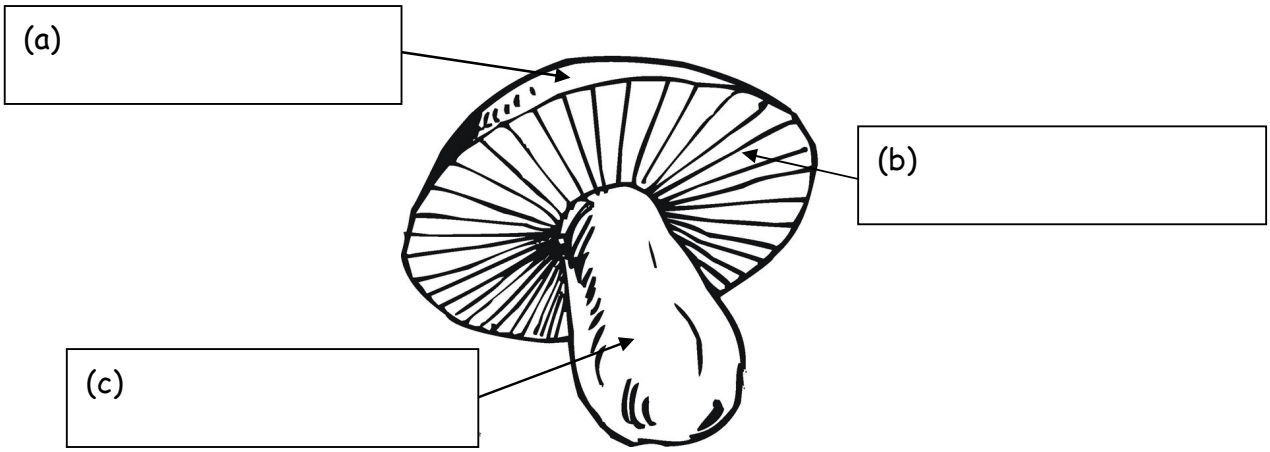


Mushrooms

Name: _____( ) Class : _____ Date: _____

1. This is a mushroom. Label the 'cap', ' stalk' and 'gills' of the mushroom by filling up the correct boxes.



Use the helping words in the boxes provided to fill in the blanks from Questions 2 to 4.

dormant	decomposition	spores
break down	fungi	rain

2. Mushrooms and toadstools belong to the _____ kingdom.

3. Fungi are dispersed by _____ which are invisible to our naked eye. These spores may remain _____ for weeks or months. An increase in moisture, usually brought by _____, will trigger their rapid blooming to life.

4. They have an important role to perform in the ecosystem – _____. Without them, the ground will pile up with tons of dead leaves and branches every day. The job of the fungi is to _____ _____ all of this valuable organic matter and unlock the nutrients so that they may be re-used by other living plants.

5. The edible fungi are readily consumed by a host of creatures like _____.

6. Visit a nature reserve or observe your school garden. Draw or take a picture of a toadstool or mushroom.

Name: _____( ) Class : _____ Date: _____

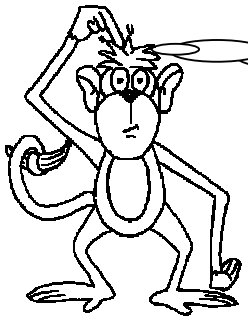
Challenges confronting biodiversity

Climate change has brought about many changes in weather. Use the helping words in the box to fill in the blanks.

fires	rainfall	flooding
droughts	hotter	frequent

There have been prolonged (1) _____ that led to widespread (2) _____  as well as intense (3) _____  in some tropical areas, leading to extensive (4) _____  events. Many lives were lost and numerous people were displaced from their homes in the affected regions.

With increasing climate change, Singapore could experience (5) _____ days and nights and also more (6) _____ heavy rainfall.



When the environment of my habitat changes, will I be able to survive?

Match some of the factors affecting organisms' survival rate to the correct descriptions.

Factors		Descriptions
Resilience	•	• How mobile is the species able to venture beyond the traditional boundaries and move to new habitats?
Habitat	•	• How well can the species tolerate drastic changes in environmental conditions?
Reproduction	•	• Is there an alternative water source if streams in rainforests are reduced to a trickle?
Diet	•	• - Is breeding behaviour triggered by any particular environmental cue? - How many offspring are produced per mating? - How regular is the species known to breed?
Water	•	• Is there sufficient shade or shelter to hide from the heat?
Mobility	•	• What is the relative availability of food? Does the organism have a generalist or specialist diet?

Roles of Rainforests – 3 'C's

Conservation of the rainforests in Singapore is important for many reasons. Rainforests play a supporting role in combating climate change. Fill in the blanks below with suitable words.

1 Cool

A combination of tall trees, dense vegetation and multiple layers in the rainforest helps to block out _____ and _____ from the sun, keeping the temperature in the rainforests cool.

2 Carbon Sink

Rainforests capture large quantities of _____ _____, a greenhouse gas from the environment, through the process of photosynthesis. Cumulatively, our rainforests act as significant _____ sinks, storing excess carbon quantities and only releasing them progressively with the _____ process.

3 Catchment

The forests that surround our central reservoirs serve as a _____ catchment. Numerous streams meander through these rainforests, purifying the water which eventually enters the _____. Without the rainforests, these fragile streams cannot be sustained and will be choked with silt and run dry.

Tricks for surviving in the Rainforest!

Name: _____ ( ) Class: ____ Date: _____

Organisms in a habitat need to be well-adapted to their environment in order to survive. Study the rainforest animals below and write down whether the adaptation mechanisms described are structural or behavioural, and how these adaptations help in their survival.

(A) Malayan Colugo's adaptation mechanisms

	Mechanism	Type of adaptation (Structural/Behavioural?)	How this helps the species in its survival
1	It has a very large, flexible membrane that acts like a parachute.		
2	It has fur which blends with the colour of the tree bark.		
3	It stays motionless on the tree in the day, but is active at night.		

(B) Pangolin's adaptation mechanisms

Mechanism		Type of adaptation (Structural/Behavioural?)	How this helps the species in its survival
1	It has strong claws.		
2	It has a long, sticky tongue.		
3	It has scales.		
4	It can roll up into a ball when threatened.		
5	It is active at night.		

C) Assassin Bug's adaptation mechanisms

	Mechanism	Type of adaptation (Structural/ Behavioural?)	How this helps the species in its survival
1	It has a flexible, segmented proboscis that delivers potent toxin into the victim's body.		
2	At the juvenile stage, certain nymphs cover themselves with debris (above).		

D) Moth's adaptation mechanisms

	Mechanism	Type of adaptation (Structural/ Behavioural?)	How this helps the species in its survival
1	It looks brown like dried leaves.		
2	It is active at night.		

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Some of the living things you may get to see in the rainforests are listed in the table below. Refer to the book, "Our Fragile Rainforests" for more varieties of flora and fauna.

	Stick Insect
	Saint Andrew's Cross Spider
	Termite
	Planthopper
	Forest Ant

	Long-tailed Macaque
	*Rothmannia macrophylla*
	Blue Fungus
	Wagler's Pit Viper
	Malayan Horned Frog/ Long-nosed Horned Frog
	Yellow Striped Tree Skink


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