

Unscramble Me

Overall Details

Objective	<p>To educate children on Singapore's native biodiversity namely:</p> <ul style="list-style-type: none">• White-collared Kingfisher (<i>Todiramphus chloris</i>)• Sunda Pangolin (<i>Manis javanica</i>)• Oriental Whip Snake (<i>Ahaetulla prasina</i>)• Common Rose Butterfly (<i>Pachliopta aristolochiae</i>)• Pearly-banded Bee (<i>Nomia strigata</i>)
Summary	<p>This activity stimulates the minds of participants by guiding them to brainstorm of the possible native species which are "hidden" in the scrambled words.</p>
Duration	<p>10 - 15 min</p>
What Participants will need:	<ul style="list-style-type: none">• Pen/Pencil

Activity Description

a) General Instructions

No.	Instructions	Comments
1	Unscramble the words to uncover the name of the native species.	Parents can share some fun facts regarding the animals which are featured in the activity. You may refer to the Background Information & Fun Facts attached to the back of this document.

Background Information & Fun Facts

White-collared Kingfisher (*Todiramphus chloris*)

Physical Characteristics

- Has:
 - An aquamarine/shining cobalt blue upperparts and head
 - Black bill and feet
 - A thick white collar
 - An entirely white underparts
- Medium-sized kingfisher: Measures around 24-25 cm in length
- Both male and female White-collared Kingfishers resemble each other, but the female is more greenish in colour compared to the male



Fig. 1 White-collared Kingfisher perched on a log
(Photo Credit: Saurabh Sawant)

Behaviour/Habitat

- Most commonly sighted kingfisher in Singapore
- Originally a bird of the coast, but it showed great adaptability towards the urban landscape → can now be sighted all over Singapore
- Can also be found in various parts of the world, such as the coastal Middle East, the Indian subcontinent, and Southeast Asia
- Calls produced may vary, but most commonly sound like a series of 5 to 6 harsh 'kip' notes/maniacal laughter
- Often sighted in mangrove habitats and coastal areas such as Sungei Buloh Wetland Reserve and St. John's Island
- Feeds on fish, crabs and other crustaceans near coastal areas
- Areas further inland: Its diet switches to lizards, small snakes, frogs, earthworms and insects like beetles and grasshoppers
- Uses its strong bill and neck to beat larger prey against a branch
- Often dives to pick up exposed animals on the seashore

Conservation Status

- Listed as a species of Least Concern according to the Singapore Red Data Book (RDB) Version 3

Supplementary Information on kingfishers

- One of the brightest coloured birds but are difficult to spot due to:
 - Their ability to fly quickly and low across the surface of the water to hunt for freshwater fish and aquatic invertebrates from riverside perches
- Usually reside near slow-moving river banks or by the side of lakes
- Not all kingfishers in Singapore are native
 - Some of them are migratory¹, such as the Common Kingfisher (*Alcedo atthis*), which is only observed near water bodies locally from August to March annually



Fig. 2 Common Kingfisher (*Alcedo atthis*) eating a fish
(Photo Credit: Ebird)

¹ Migratory: Travel in large numbers to a different place

References:

<https://www.nparks.gov.sg/nparksbuzz/issue-40-vol-1-2019/conservation/meet-the-%E2%80%9C9Ckings%E2%80%9D-of-singapore%E2%80%99s-skies>
https://eresources.nlb.gov.sg/infopedia/articles/SIP_1509_2009-04-21.html#:~:text=The%20white%2Dcollared%20kingfisher%20is%20widely%20distributed%20geographically%2C%20over%20a.Australia%20and%20the%20Samoan%20islands.

Sunda Pangolin (*Manis javanica*)

Physical Characteristics

- Can be distinguished from the Philippine and Chinese Pangolins by:
 - Fewer rows of scales across its neck
 - Shorter forelimb claws
 - Longer, more slender tail
 - Longer head and body-to-tail length ratio
- Scales are predominantly dark brown in colour, despite “white” scales being found often on its tail
- Has a long snout, a long tongue laced with sticky saliva, coupled with sharp front claws to aid in excavating and consuming termites from the mound
- Small conical head with eyes that are protected by thick eyelids
- Possesses a prehensile¹ tail
- Ability to close its nostril and ear openings



Fig. 1 Sunda Pangolin
(Photo Credit: Max Khoo)

¹ Prehensile: Adapted for grasping by wrapping around something

Behaviour/Habitat

- Can be found in the Philippines, Vietnam, Laos, Cambodia, Malaysia and Singapore and is normally resident in Southeast Asia's forested habitats
- Terrestrial animal that inhabits burrows, either dug out with its claws or borrowed from previous residents
- Can be an agile climber that spend its time within trees (also known as arboreal animals) resting/searching for food
- Female Sunda Pangolin
 - Tends to have only one offspring after a gestation period of 3 to 4 months
 - Reaches reproductive maturity towards the end of its first year
- Threatened by habitat destruction and roadkill accidents

Conservation Status

- Listed as Critically Endangered according to the Singapore Red Data Book (RDB) Version 3

Supplementary Information on pangolins

- 8 species of pangolins worldwide:
 - 4 of which are found in Asia:
 - Chinese Pangolin (*Manis pentadactyla*)
 - Sunda Pangolin (*Manis javanica*)
 - Indian Pangolin (*Manis crassicaudata*)
 - Philippine Pangolin (*Manis culionensis*)
 - Other 4 are African species:
 - Ground pangolin (*Smutsia temminckii*)
 - Giant Pangolin (*Manis gigantea*)
 - White-bellied Pangolin (*Manis tricuspis*)
 - Black-bellied Pangolin (*Manis tetradactyla*)
- Pangolin scales are made of keratin, the same compound found in our fingernails
- Populations of all these species are dwindling due to illegal trade
- Reason for illegal trade :
 - Despite having no proven medicinal value, they are highly sought after in traditional medicine to cure ailments such as arthritis¹ (not applicable to Singapore)
- Solitary and nocturnal animals
- Majority of them reside on the ground
 - One of the exceptions include: Black-bellied Pangolin (which climbs trees)

- Nickname given to pangolins: “scaly anteaters”
- When faced with an imminent threat, they:
 - Roll into a ball, similar to armadillos
 - Secrete a foul liquid from a gland located at the base of their tails to defend themselves
- Characterised by their long snouts and even longer tongues - useful in helping them lap up ants and termites



Fig 2. A Cape Pangolin (*Smutsia temminckii*) rolled up into a ball

(Photo Credit: African Pangolin Working Group)

¹ Arthritis: Joint inflammation



Fig 3. A Tree Pangolin (*Manis tricuspis*) lapping up termites

(Photo Credit: Peter Csandi)

References:

https://www.inaturalist.org/guide_taxa/178736

<https://www.nationalgeographic.com/animals/mammals/facts/pangolins>

<https://singaporepangolinwg.wordpress.com/sunda-pangolins/>

Oriental Whip Snake (*Ahaetulla prasina*)

Physical Characteristics

- Adult: Striking green colour
- Juvenile: Yellow to pale brown
- Adult Oriental Whip Snake can grow up to 2 m long
- Longest species of whip snake
- Eye pupil is horizontally elongated



Fig. 1 Oriental Whip Snake
(Photo credit: Ecology Asia)

Behaviour/Habitat

- Feeds on vertebrates such as lizards, frogs and small birds
- Is mildly venomous, but the venom is too weak to kill humans
- Is active during both day and night
- Extending of tongue suggests that it feels disturbed
- Eggs are retained and hatched in the mother snake's body
- Can be found in the trees and bushes of gardens and parks such as Singapore Botanic Gardens
- Widely distributed in Asia

Conservation Status

- Listed as a species of Least Concern according to the Singapore Red Data Book (RDB) Version 3

Supplementary Information on snakes

- More than 3000 species of snakes in the world
- Carnivorous
- Do not have eyelids
- Smell with their tongues

References:

<http://www.wildsingapore.com/wildfacts/vertebrates/snakes/prasina.htm>

<https://www.nparks.gov.sg/nparksbuzz/jan-issue-2021/facts/oriental-whip-snake#:~:text=The%20Oriental%20Whip%20Snake%20>

<https://australian.museum/learn/animals/reptiles/yellow-faced-whip-snake/>

Common Rose Butterfly (*Pachliopta aristolochiae*)

Physical Characteristics

- Has black wings with grey shaded lines in between (applies to both males and females)
- Has distinct bright red spots on its hindwings
- Bright red body serves to warn its predators that it is distasteful and should be avoided



Fig. 1 Common Rose Butterfly

(Photo Credit: Robin Ngiam, NParks Flora & Fauna Web)

Behaviour/Habitat

- Rather rare and can be spotted in several Southeast Asia countries e.g. Thailand, Malaysia and Singapore
- Originally a jungle species but it is drawn to cultivated areas such as urban parks where its host plant, the Indian Birthwort (*Aristolochia acuminata*), is being grown in these areas
- Strong flyer
- Visits puddles of water on the ground

Conservation Status

- Listed as Near Threatened according to the Singapore Red Data Book (RDB) Version 3 due to the decline of its host plant, the Indian Birthwort (*Aristolochia acuminata*)

Supplementary Information on butterflies

- 320 species of butterflies can be found in Singapore
- The few common species that can be found in urban areas includes:
 - Lime Butterfly (*Papilio demoleus*)
 - Grass Blue Butterfly (Family: Lycaenidae)
 - Chocolate Pansy Butterfly (*Junonia iphita*)
- Play a vital role in our ecosystem by cross-pollinating flowers
- Can taste with their feet and determine if a plant is safe for the caterpillar to eat
- Feed through their proboscis¹
- Their sizes range from 1 cm to the size of a dinner plate
- Smallest butterfly species in the world: Western Pygmy Blue Butterfly (*Brephidium exilis*), with a wingspan of 1.3 cm
- Largest butterfly species in the world: Queen Alexandra's Birdwing (*Ornithoptera alexandrae*), an endangered species residing in the rainforests of Northern Papua New Guinea, with a wingspan of around 27 cm



Fig. 2 Western Pygmy Blue Butterfly (*Brephidium exilis*)
(Photo Credit: Nature Collective)




Fig. 3 Queen Alexandra's Birdwing (*Ornithoptera alexandrae*)
(Photo Credit: Fact Animal)

¹ Proboscis: A tube that acts like a tongue for the butterfly to suck liquids such as nectar and juice from fruits

References:

<https://www.nparks.gov.sg/florafaunaweb/resource/-/media/ffw/general/field-guides/a-guide-to-common-butterflies-in-singapore,-and-creating-a-butterfly-friendly-gardenv3.ashx>
<https://www.cbc.ca/kids/articles/five-fun-facts-about-butterflies>
<http://www.butterflycircle.com/checklist/showbutterfly/10#:~:text=This%20species%2C%20which%20shares%20the,flower%20in%20search%20of%20nectar.>
<http://www.nationalbutterfly.org.sg/#page7/2>
<https://www.nparks.gov.sg/florafaunaweb/fauna/3/2/327>

Pearly-banded Bee (*Nomia strigata*)

Physical Characteristics	
Size	<ul style="list-style-type: none">• Around 9 mm
Distinct Features	<ul style="list-style-type: none">• Bright opalescent¹ coloured bandings on its abdomen<ul style="list-style-type: none">◦ Vary from yellow-green to bright blue• Black eyes• Dark thorax <div data-bbox="597 577 1281 1031"></div> <p>Fig. 1 Pearly-banded Bee resting on a leaf (Photo Credit: Zestin Soh, NParks Flora & Fauna Web)</p> <p>¹ Opalescent: Reflecting colours that seem to change from different angles</p>
Behaviour/Habitat	
<ul style="list-style-type: none">• Buzzes loudly at a specific frequency when collecting pollen from buzz-pollinated plants such as the Singapore Rhododendron (<i>Melanoma malabathricum</i>)• Mixes and drinks pollen with nectar• Solitary bee• Also known as the Striped Nomia• Can be spotted at the following places in Singapore:<ul style="list-style-type: none">◦ Parks such as Coney Island Park and nature reserves◦ Mangroves◦ Forests• Native plants they visit: Seashore Ardisia (<i>Ardisia elliptica</i>), Singapore Rhododendron (<i>Melanoma malabathricum</i>)• Native edible plants they visit: Tomato, Chilli and Brinjal	
Conservation Status	
<ul style="list-style-type: none">• Listed as a species of Least Concern according to the Singapore Red Data Book (RDB) Version 3	

Fun Facts & Common Misconceptions

- **Not** all bees:
 - Have yellow and black stripes
 - Produce honey (only less than 4% of all the bees in the world make honey)
 - Sting
- Certain species of bees can become potentially dangerous when their hives are disturbed

References:

<https://www.nparks.gov.sg/nparksbuzz/issue-43-vol-4-2019/gardening/bee-list-stars>

<https://www.singaporegeographic.com/insects/bee-wasp-hornet/pearly-banded-bee-nomia-strigata>

<https://www.nparks.gov.sg/florafaunaweb/fauna/1/2/1294>
