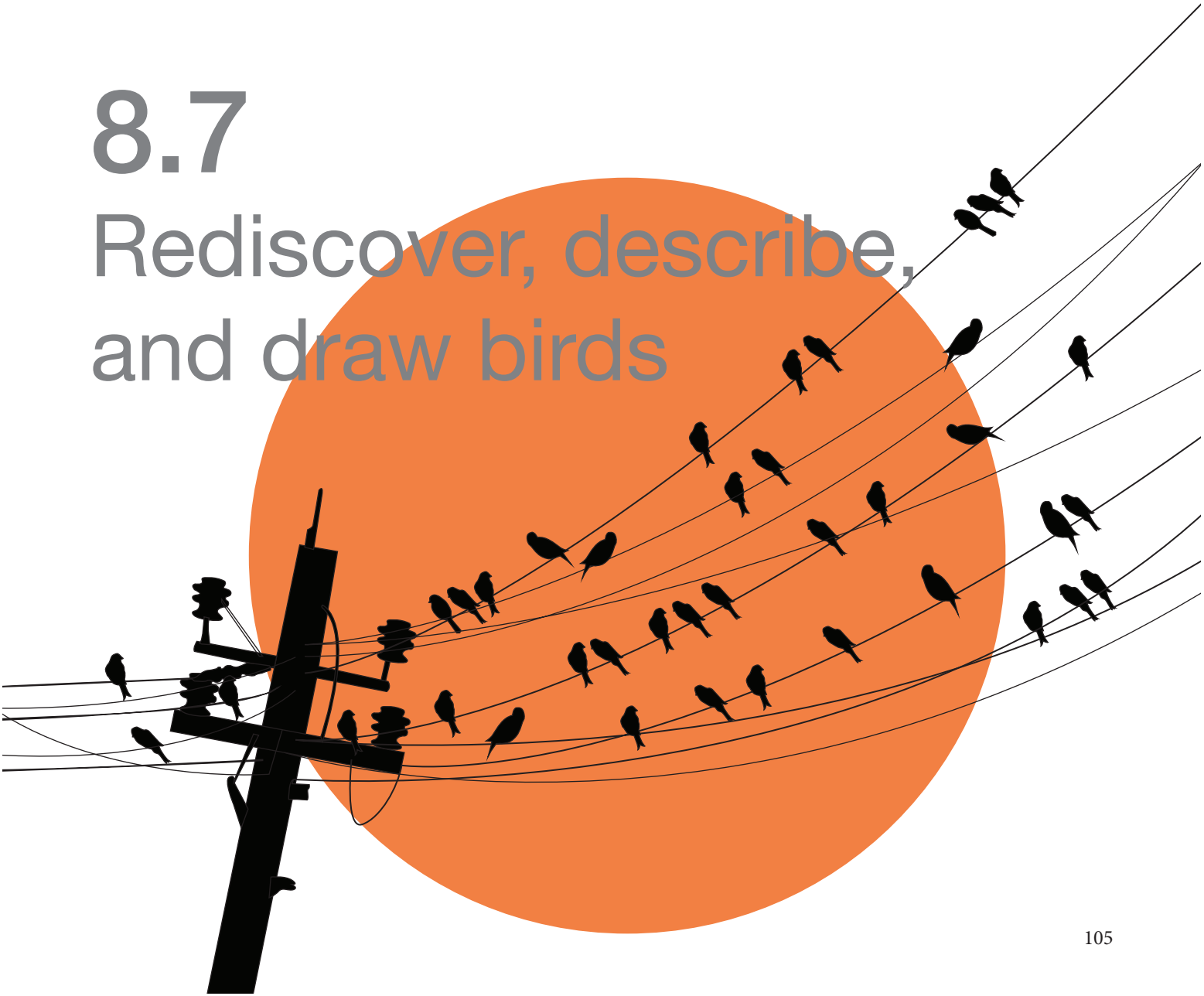
8.7 Rediscover, describe, and draw birds



8.7. Rediscover, describe, and draw birds

Minimum time required

Three indoor sessions over a month, 80-120 minutes each, with outdoor observations every day of the month. The activity can be extended over several weeks, months, or a year, which will give opportunity to observe birds over different seasons.

Type of Learning Unit

Field and classroom. The outdoor component is variable.

Overview

This Learning Unit requires students to keenly observe birds in the neighbourhood and document the observed species. Students will observe a bird within their environment and collect data, and later use this data to create some resources and documentations.

Unit-specific objectives

- To make links between the presence of birds, bird behaviour, variation in birds, etc., and the environment (biotic/abiotic/ natural/artificial)
- To observe life-forms in their natural environment, and develop the skills of observation, attention to detail, documentation - all integral to the scientific process
- To re-establish the fading human connection with nature

Links to curriculum

NCERT Class 9 Science textbook: Chapter 'Diversity of living organisms' (Aves section)

NCERT Class 8 Science textbook: Chapter 'Conservation of plants and animals' (Bird migration section)

NCERT Class 6-9 Science textbooks: Sections on food chains, similarity of shape between a bird and an airplane, food sources, etc.

Prerequisite science concepts for the teacher mentor

- A general understanding of bird anatomy.
- A basic knowledge and understanding of different bird behaviours, and their role in the ecosystem would be an added advantage.

Background

Sometimes you see a colourful bird whiz past you, and you long to see it again. At other times, you wonder when the neighbourhood crow is going to stop cawing and leave you at peace. Birds are everywhere. They occupy almost all habitats and are a delight to watch! They sing, hunt, eat, fight, fly, swim, and display other behaviours that leave you perplexed. Birds always riddle you with their actions! You notice a pair of small birds screech their hearts out and take on a bird that is double their size. Why would they do that? Suddenly you notice the small birds were trying to protect their nearly invisible (camouflaged) eggs from the big bird. As you keep observing them, you will see a story unfold. Documenting their behaviour translates to honing several important skills such as: writing an accurate scientific description, maintaining logs, organising information, etc.

With increased globalisation, people are coming closer to each other more than ever. But we also seem to be severing our ties with nature. All of us seek solitude in nature. Watching and listening to birds will hopefully re-establish our fading connection to nature, which aids in physical and mental well being (Children & Nature Network and IUCN-CEC Report, 2012), and create an awareness of the diversity of living things.

So, let's do some bird-watching!

Materials

Notebook, pen, pencil, colours, binoculars. Camera and field guides (illustrated manuals for identifying natural objects) may be optional.

Outline of sessions

In this Learning Unit, the following three indoor sessions are expected to be carried out:

i. Introduction: introductory discussion, learning games, followed by Task 1
ii. Follow-up: discussions in groups (Task 2)
iii. Refining documentation (Task 3)

	Teacher	Students
Introductory session (80-120 minutes)	Introduction topic ↓ Elicit students' prior ideas, discuss background information ↓ Discuss ethics of bird-watching ↓ Conduct learning games ↓ Discuss task 1 instructions	Share your own ideas/stories questions about birds ↓ Discuss ethics of bird-watching ↓ Play the learning games + Reflect on it. ↓ Revise task 1 instructions and ask questions (if any)
Students carry out task 1 for (1 + 3) weeks. If at the end of one week, students are unable to pen down observations, then ask them to refer to the "Observation Guidelines" [student handout #3]		

Follow- up session (80-120 mins)	Discuss Task 2 instructions ↓ Group "same species" together ↓ Ask "Guiding Questions" in student handout #2 ↓ Guide students as and when required	Read instructions for task 2 ↓ Make groups such that "same species" are together ↓ Discuss and write your observations & answers for "Guiding Questions" listed in student handout #2.
Students carry out observations for another week or two. Repeat Task 2 if required. Then proceed to Task 3.		
Refining documentation (80 mins)	Help students consolidate thier data and refine it. ↓ Share templates of interaction maps/ flash card/ other resources ↓ Encourage students to document their data properly. Guide students as and when required	Re-consolidate your data. Read task 3 instructions ↓ Brainstorm ways to make visual and textual resources. ↓ Make resources with your data. For ideas, you may refer templates given in student handout #2

Table T1

The following sections of this Learning Unit detail out these sessions, and the respective teacher resource material and student handouts. These are followed by additional information for teachers, in terms of various tips including what to expect, more resources, as well as background information, FAQs, and the Appendix.

Please go through student handouts 1, 2 and 3 before you proceed.

I. Introductory Session (80-120 minutes)

Initially the teacher can draw out some responses from students regarding their prior knowledge on birds by asking some questions like: *What birds do you commonly see around the school/home? Which is your favourite bird? Why so? Are there stories you have heard about birds? What is funniest thing you have seen a bird do? Describe the most colourful bird you have seen.*

The teacher can ask students to write down their responses in their notebooks, which she can later refer to. The teacher can then share some interesting facts about birds to get them more interested and excited about the activity. Some of these points can be:

- There are roughly 9,000-10,000 species of birds in the world, around 1200 species can be found in India.
- Of these 1200, about 80 are endemic, meaning 'only found in India'.
- Two of the most recently discovered birds of India are the Himalayan Forest Thrush (in 2016) and Bugun liocichla (2006), both discovered in Arunachal Pradesh.

The teacher can also use some information given in the Background section for introducing birds. The teacher can make presentations, share videos or pictures etc. This will be followed by Basics and ethics of bird-watching with students [Student Handout *#1*]. **Discussing these is absolutely essential and central to the activity.**

Some fun learning games to prime the students' observation skills

1. Choose a picture of a bird (e.g. Red Whiskered Bulbul), project it for students to see and get them to identify all the body parts using Student Handout *#1* as a key. (https://commons.wikimedia.org/wiki/File:Red-whiskered_Bulbul_from_Goa_1.JPG. Creative Commons/ Nilesh Waradkar).
2. Silhouette Game: Collect some bird silhouette pictures and project them OR make flash cards. Ask students to guess which bird it might be and ask them to justify their answers. Use Teacher Resource *#1*.
3. Picture Card Game: Make picture cards of these four birds: House crow, Black Drongo, Indian Robin (Male), Asian Koel (Male). Use Teacher Resource *#2*. Divide the class into groups and give one picture card to each group. Ask them to describe the physical features of the bird in detail. Each group must write five features that help identify the bird. The four images may also be pasted on a large sheet and displayed to the class. The teacher may read out observations of each group while the rest of the class guesses which bird she is describing. If you want to add more birds to this game, include Large-billed Crow, Indian Cormorant, Ashy Drongo and Indian Blackbird.

Teacher Resource #1: Silhouette Game

Collect some bird silhouette pictures (as shown in figure T1), and project them on a screen or make flash cards. Alternatively, you can download this page from www.vigyanpratibha.in for printing. Ask the students to guess which bird it might be, and ask them to spell out the reasons for their answers.

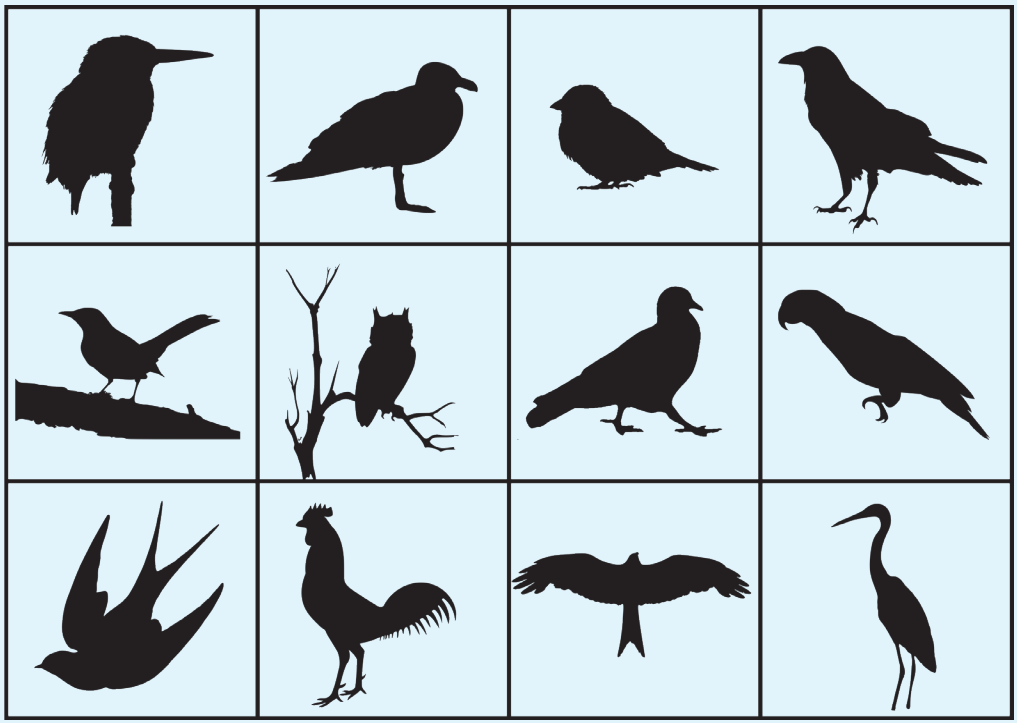


Figure T1 *Bird silhouettes*

Correct guesses: *(Top row onwards, left to right)*: Kingfisher, Gull (sea bird), Sparrow, Crow, Robin, Owl, Dove/Pigeon, Parakeet/Parrot, Swift/Swallow, Rooster/Cock, Kite/Raptor, Heron/Egret.

Teacher Resource #2: Picture Card Game

Make picture cards of these four birds: House crow, Black Drongo, Indian Robin (Male), Asian Koel (Male). (You can download these pictures from www.vigyanpratibha.in for printing). Divide the class into groups and give one picture card to each group. Ask them to describe the physical features of the bird in detail. Each group may write at least five features that help identify the bird. The four images may be pasted on a large sheet and displayed to the class. The teacher may read out observations from each group, while the rest of the class identifies which bird is being described. If you want add more birds to this game, you may include Large-billed Crow, Indian Cormorant, Ashy Drongo, and Indian Blackbird.

Figure T2 *Picture cards*

Bird names: (Top left, clockwise): House Crow, Indian Robin (Male), Black Drongo, Asian Koel (Male)

4. Teacher can show different behaviour clips of birds. For example:
   Feeding: https://www.youtube.com/watch?v=Yh8FyJEo0KE
   Making Nest: https://www.youtube.com/watch?v=7eXEH-r4amE
   Foraging: https://www.youtube.com/watch?v=Ccy4-JY98Mk
   Bathing: https://www.youtube.com/watch?v=akoAJPiEE3I
   Preening: https://www.youtube.com/watch?v=zeGE_dZyd4E
   Calling: https://www.youtube.com/watch?v=-hO_uGIxBLg
   Fighting: https://www.youtube.com/watch?v=p65q5wUpKZg

For more such videos, visit YouTube Channel: Earthly Notes (https://www.youtube.com/channel/UCsfTZNxOjayI3fPS-I8Chmg)

Ask the students to identify/describe the behaviour using "Knowing terminology related to bird behaviour" in *Student Handout #1* as a key.

5. Following this, give the students the following task.

- Carefully go through the "Basics and ethics of bird-watching" [Student Handout #1].
- Choose a safe place in school/near your home, where you notice bird activity.
- For ten minutes in the morning, noon, and evening, spend time observing one species of bird.
- Write the following header information in your notebook: day, date, time, weather, location, and for how long you carried out your observation activity.
- Observe the birds patiently and quietly. Write down everything the bird does.
- Refer to Student Handout #1 titled "Terms used to describe bird behaviour" and "Parts of a bird". Try to use the terms in your descriptions and drawings.
- Draw the bird, as you see it, and label it. You can also colour it if you would like to. It is alright if your drawing is not beautiful. Focus on drawing what you see.

These instructions are repeated in Student Handout #2.

Once the instructions for task 1 are discussed, take the students outdoors and either let them decide which bird they want to observe or assign a species to each student/group. Remind the students that they will have to observe the bird over several weeks, so for the beginners, it's best to choose the commonly sighted birds like House Crow, House Myna, House Sparrow, Blue Rock Pigeon, Black Kite, etc.

What to expect from the students ?

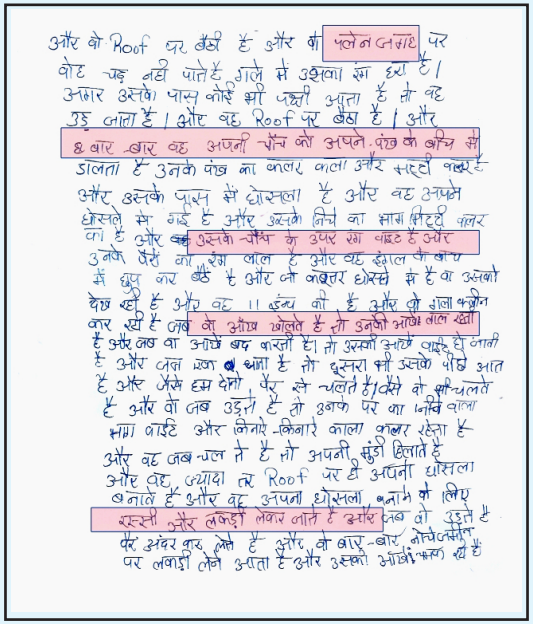


Figure T3 *Snapshot of grade 8 students' field notes*

Encourage students to write rich descriptions of their observations and make detailed drawings. Figure T3 shows a glimpse/example of what teachers can expect from students. In general, observations are expected to include the parameters and aspects mentioned in *Student Handout #3*.

Important Tip: Students are likely to find it difficult to go about the observation task as they may not know what to observe specifically. If at the end of one week, students are unable to pen down observations, then ask them to refer to the "Observation Guidelines" [Student Handout #3]. If they don't know what to observe, they can start by answering the questions listed in the Observation Guidelines sheet.

II. Follow-up: Discussion in groups (to be conducted after 4 weeks, 80-120 minutes)

***Discuss instructions for task 2, as listed in* Student Handout #2.**

Once the instructions for task 2 are discussed, the teacher groups all the "same species" together. For example, all the students/groups who observed "House Crow" will now sit together and discuss their observations. They will try to identify similarities and dissimilarities in their observations. Teacher can encourage them to notice if any patterns emerge or if any generalisations can be made.

For example: What is the diet of the bird? Or what was the bird feeding on? *(See figure T4)*.

Some questions that the teacher can use to guide the group work are given in "Guiding questions for Task 2" [Student Handout #2]. Students will continue to make observations in the following week as well. They can try to seek answers to questions that were discussed in this session.

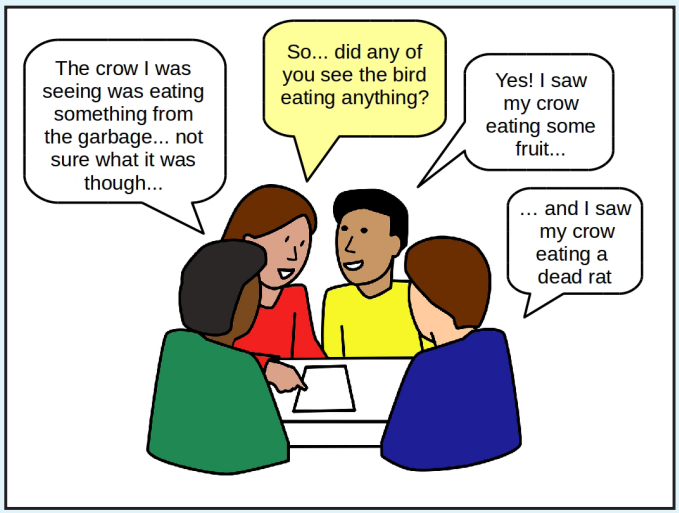


Figure T4 *Group work during follow-up session 2*

III. Refining documentation (after 1-2 weeks, 80 minutes)

***Discuss instructions for task 3, as listed in* Student Handout #2.**

Once the instructions for Task 3 are discussed, students will once again consolidate their data like in the previous session. Students could continue to work in their groups (same species) or individually. In this session, students will work towards refining their documentation. They can add mind maps, flowcharts, flash cards or present their observations in any visual form in addition to their orginal writing. Towards the end, the students are expected to submit their observation notes.

Example: Students can work in groups to make interaction maps. The map is essentially a snapshot of all of the bird's interactions with its immediate surroundings. The map shows in brief all the interactions the pigeon has had with its immediate surroundings. Some of these components are living (can be marked in green) while some are non-living (can be marked in blue). Templates for interaction map and flash card are provided in Student Handout #2. Students need not follow these templates exactly; they can use their imagination to make any sort of map to visualise the data they have collected over the last few weeks.

Important notes

1. Students' documentation should be a reflection of what students observed over the last four weeks or more. It should not be copied from books or the Internet.
2. Encourage students to use the new terms they have been introduced to in Student Handout #1. (For example, see the *italicised words* in the interaction map in Student Handout #2, figure 2)
3. If you/students think that the data collected is not enough, then continue the observations for a few more weeks.
4. Note that Student Handout #2 contains the summary of the student task instructions which teachers may hand out to students, if needed.
5. Target learning trajectory: For a bird observed by the students, get them to progress from the level of descriptions mentioned in point 1 to description mentioned in point 5 *(See figure T5).*

1. I saw a small black bird today.

2. I saw a small black bird today. It was as small as the palm of my hand.

3. I saw a black bird today. It was as small as the palm of my hand. Its eye was black. It had a long tail.

4. I saw a black bird, which had a brown vent. It was as small as the palm of my hand. Its eye was black. It had a long tail, white legs and grey beak.

5. I saw a black bird with a brown vent. Its height was as much as the palm of my hand, so that's around 10 cm. Its eye was black. It had a long tail, which it keeps up, white legs and greyish beak. Its call was high-pitched.

Figure T5 *Describing an Indian Robin (Male): Example of a target learning trajectory*

Advantages of this activity

- The activity does not require students to have any specific pre-requisite domain or content knowledge. In fact, the activity can probably draw upon students' own experiences with birds.
- Even the teacher need not have in-depth content knowledge about birds (like bird-taxonomy, classifications etc.) for this activity.
- The activity caters to multiple modes of expression: students can make written records, drawings, and orally communicate with each other between and across groups.
- The activity will not use expensive equipment, only eyes and ears, pen and paper.
- This will be an outdoor learning experience which will involve teaching students to explore and discover their surroundings.
- This initial activity provides opportunities for many follow-up or sequel activities.

Limitations

- Identifications and classification is outside the scope of this study. Adding classification might make this activity more complex.
- Observations will be limited given that no equipment (binoculars, scope) is being used. However, providing such equipment is an option that schools may consider.

Significance of this "Local Context" activity when done across India

- Diets/micro-habitats of common birds may show vast difference across India.
- Nesting materials of the same species can differ across various regions (rural/urban).
- Presence (common, uncommon, rare) of a species will vary across regions. For example: A bird that is rare in one region may be common in another region.
- Behavior variation across regions may be documented. For example, students can report song variation among the same species across India.
- Students can discuss and compare their observations with students from other parts (schools, regions) of the country using the Vigyan Pratibha Student Discussion platform.

Extension activities

If your students are keen on taking this activity further, you can suggest the following extended learning activities to them.

i. Students can be taught how to use and refer to Field Guides, which can help them identify more birds in the area.
ii. Students can create a repository or database, attendance register of birds of the surrounding area, by documenting them on flash cards or posters.
iii. Students can follow the same bird for an entire year and make notes on seasonal variation in the behaviour and anatomy (for example, peacocks shed their long tails in the winter).
iv. Students can document the cultural history and stories on birds, by interviewing elders in the neighbourhood. This could also serve as the starting point of a preliminary ethno-ornithology study or a study of the relationship of human beings and birds.
v. Students may be encouraged to upload their observations and photographs to social media with appropriate hashtags (#).

Frequently Asked Questions (FAQs) for teachers

1. What if the student asks me the name of a bird I don't know.

It is alright to not know the name of the bird. Talk to the student about how India is home to more than 1000 species of birds, and it may be difficult to keep tab of all their names. However, if you know the name of the bird (in regional/local language or other language), you can inform the student the same. Alternatively, you can tell the student that we can find out the name of the bird together. Ask him/her to describe the bird in detail (giving indication about size, shape, colour, beak). Point them towards books that may help identify the bird (See the Field Guides section). They should observe the behavior of this bird and describe it in detail, and then look it up later in books, should the need arise. You can also approach a local bird expert or get in touch with the HBCSE team if you have any queries.

2. What if students say that they are unable to observe details, because the bird is too far ?

Tell them that even in the olden times, when binoculars and telescopes were not available, people made observations with their naked eye by learning where and how to find and watch birds. This is one way to train your eyes to become

keen observation tools. Encourage your students to pick common birds that are easy to observe, but if a student takes up the challenge of a far away bird or an uncommon bird, encourage them to observe whatever they can. They may have to extend their observation time to get information about it. Even a few details are important ones.

3. I still don't understand what is it that students learn by watching birds ?

One of the main reasons to get students to watch birds is to develop their skills of observation. Observational skill in this context would mean the ability to be perceptive about the details of a complex natural environment. The skill of being a keen observer of minute changes, to write scientific descriptions, meticulous data recording and maintenance, are all skills that are integral to any scientific process. So this activity is directed more at understanding the process of science. And as mentioned earlier, it is also an attempt to re-establish our fading connection to nature.

4. Is there some way I can "teach" them to observe carefully ?

Observation skills develop over time and with practice. You can try out some simple learning games, listed in session 1 prior to task 1. Alternatively, you can ask all students to quietly observe the same bird from their classroom window, for 5 minutes. Use the Student Worksheet. Then pool in your observations (behavioral traits of the bird) and write them on the blackboard. Use Student Handout #3 (Observation Guidelines) to direct their attention to some aspects of the bird. You can extend this exercise to the school grounds as well. With this, the students will get an idea of how to go about the task. Also see question 9 below.

5. What if students are not making beautiful drawings ?

Many scientists start off with hurriedly scribbling notes and keep a rough field diary of sketches, even birds drawn as stick figures! The important thing here is not the beauty of the drawing, but the information it conveys. Point out to your students that the drawings are to help convey a message or record the details, and that the students need to convey their impressions of what they see. For this purpose, any drawing is beautiful! Also let them know that "more beautiful" drawings do not necessarily mean more useful drawings or more marks/points.

6. What if students have some questions or doubts on a bird's behaviour, which I am unable to explain ?

You can convert this into a learning opportunity. Answering "why" questions would need students to go beyond observation. They may have to seek answers from multiple sources. During the course of this activity, it is best for

students to refrain from using the Internet, as it may bias their observations and they may tend to report what they have read rather than what they observe. However, after the observation tasks, if students are keen on finding answers to the questions they have, you can direct them to books and other sources, including the Internet. But do caution students about verifying their sources before relying on them. In the meantime, you too can look up information from various reliable sources, and guide students accordingly. Alternatively, the school can set up an informal "Ask an Expert" platform where students' questions are regularly sent to practitioners and experts in the concerned area, who are willing to attend to these queries. You are also welcome to get in touch with the HBCSE team in case you have such queries.

7. Can you suggest some ways to get children excited about birds and bird watching?

You can perhaps look up some relevant pictures on the Internet and show them slide shows of some interesting bird species across the world and in India. You can show them pictures of India's most colourful birds or play to them the audio recordings of India's most vocal birds and their songs. Alternatively, you can choose case studies (like that of the Vulture or House Sparrows) and narrate stories about some endangered birds and conservation efforts. There are also several games one can make around birds like Bird Bingo, quiz, puzzles, etc., which can fuel some initial excitement among students to work on birds. Refer to the listed web resources below.

8. What if my students want to take photographs of the birds they observe?

This is fine, but make it clear that it's not mandatory for students to take photographs and that taking photographs should not become a substitute for making drawings. Drawing while observing is purposefully included in the activity as a means to develop keener observation skills. Additionally, not all students may have the equipment to take photographs, and by making photographs mandatory, some students may be at a disadvantage. Also, publicly acknowledge, applaud, encourage, and give positive reinforcements to students who use basic tools to do their task. Students should not feel that they need expensive equipment to carry out this activity.

9. Is there some way I can informally check if my students' observation skills have improved?

A preliminary way to check this could be by asking students to repeat the trial task (mentioned in question 4 of the FAQ section), after 3-4 weeks. Ask all the students to quietly observe the same bird from their classroom window, for five minutes. Compare their original notes and current notes and see if they are now able to provide richer descriptions of the birds.

Field guides for bird-watching

A field guide is a book designed to help the reader identify plants, birds, animals and other objects of natural occurrence (e.g. rocks or minerals), especially when they are outdoors or "on field".

- Ali, S. (2002). *The book of Indian birds* (13th Edition). Mumbai: BNHS.
- Grimmett, R., Inskipp, C., & Inskipp, T. (2011). *Birds of the Indian subcontinent* (2nd Edition). London: Oxford University Press & Christopher Helm.
- Kazmierczak, K., and Ber van Perlo (Illustrator) (2000). *A field guide to the birds of the Indian subcontinent.* (1st Edition). London: Pica Press/Christopher Helm.
- Robson, C. (2009). *Field guide to the birds of South-east Asia.* Bloomsbury.
- *Early bird pocket guide* (Multilingual). This can be accessed from https://www.instamojo.com/NCF/early-bird-pocket-guides/

The above-mentioned field guides are available in book stores and online shopping platforms. They cost between Rs. 500 and Rs.1000. Field guides in general may be a useful addition to the school library.

Web/Print resources for teachers

The following links/books are useful resources for the teacher to use in indoor sessions. These also provide background information about the topic.

- Bird Count India: A presentation on "An Introduction to Birds and Birdwatching", includes a guide to common Indian birds, etc. https://birdcount.in/event/gbbc2017/4/
- General bird-watching information in India: http://www.birding.in/bird_watching.htm
- Pictures of Indian birds: http://www.indiabirds.com/
- Early Bird is an initiative by Nature Conservation Foundation, aimed at getting youngsters excited about Indian birds, and to develop and distribute educational materials on the same. http://www.early-bird.in/
- Indian Citizen Science Project: http://www.migrantwatch.in/citizen_science_projects.php
- eBird India portal is designed for Indian birdwatchers: http://ebird.org/content/india/about/
- Indian Birds is a publication for bird watchers: http://www.indianbirds.in/about-us/
- Bird Count India: Supporting listing & monitoring of birds across India. https://birdcount.in/
- Bird Sleuth is the K-12 education programme of the Cornell Lab of Ornithology. http://www.birdsleuth.org/

- Ecowatch section of *Teacher Plus* magazine: http://www.teacherplus.org/
- Chakravarty, R. (2019). *Bird Business: Illustrated peeks into the daily lives of Indian birds.* Mumbai, India: Bombay Natural History Society.
- Vigyan Pratibha Student Discussion platform: Visit www.vigyanpratibha.in

Activities around birds

Bird-watching is a well-known activity carried out all over the world. Behavior observation is an old tool for scientists, and for all curious human beings. Here are some links to interesting bird-watching related activities developed/ conducted around the world.

- http://www.birds.cornell.edu/physics/lessons/elementary/pdfs/tm
- https://www.massaudubon.org/content/download/13465/209556/file/PreKTeachingUnit-BIRDS.pdf
- http://sciencenetlinks.com/lessons/look-bird-watching-your-own-backyard/
- http://imnh.isu.edu/digitalatlas/teach/lsnplns/obvbrdlp.html
- http://www.pbs.org/parents/catinthehat/activity_feeding_observing_birds.html
- https://lifestyle.howstuffworks.com/family/activities/outdoor/bird-watching-activities-for-kids.html
- http://www.theteachersguide.com/birds.html

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Image sources

- **Figure 1:** *Bird silhouettes:* Pixabay (Public Domain/ Creative Commons CCO); Sparrow image: Wikimedia Commons/derivative work of 4028mdk09 /Andreas Plank
- **Figure 2:** *Picture cards*: *for Indian Robin (Wikimedia/ Challiyan) and Asian Koel (Wikimedia/ Challiyan).*
- **Figure 4:** Group work during follow-up session 2: Adapted from: Pixabay CCo Creative Commons
- **Figure 5**: Challiyan of the Malayalam Wikipedia project/ Creative Commons

This Learning Unit on observing birds, in its earlier version, featured in the Teacher Plus magazine, as a four-part series (August, October 2018, and January, February, 2019).

Student Handout #1

This Learning Unit invites you to keenly observe the birds in your neighbourhood and document their details.

Introduction to the bird-watching activity

Sometimes you see a colourful bird whiz past you, and you long to see it again. At other times, you wonder when the neighbourhood crow is going to stop cawing and leave you at peace. Birds are everywhere and occupy almost all habitats and are a delight to watch! They sing, hunt, eat, fight, fly, swim, and display other behaviours that leave you perplexed. As you keep observing them, you will see a story unfold. One can learn a lot from birds. For example, birds may serve as indicators of environmental change. Sometimes, they have served as inspirations for many human inventions and innovations. For instance, the design of the Japanese Shinkansen Bullet Train was inspired by the beak of a Kingfisher bird. And not to forget, birds also play a very important role in our ecosystem by being excellent pollinators, seed dispersers, predators to crop pests and scavenging on disease spreading animals like rats. Behavior observation is an old tool for scientists, and for all curious human beings. Animals and birds may reveal many secrets to those who are willing to observe patiently and keenly. So, let's do some bird-watching!

Basics and ethics of bird-watching

- Keep your distance from the birds when you observe them. If you think the bird is disturbed by your presence and it keeps flying away, then do not follow it.
- Do not harm the natural surroundings just to observe the bird better. For example, do not stamp over plants, or break twigs/branches to get a clear view of a bird.
- Stay on existing paths, footpath, or trails, and do not trample the fields, crops, or fragile habitats.
- Do not encroach (trespass) into private property while bird-watching. Always obtain permission from the land-owner before entering private lands.
- Do not be noisy.
- Do not feed the birds or play the calls of birds to bring them closer to you.
- Moving around may not necessarily mean you will see more birds. If you stand/sit in one place quietly and patiently, staying absolutely still, you can see many birds.
- Be extra careful about observing birds during the breeding season.

- Do not approach any nesting area or nest. Observe nests from a distance. Use a pair of binoculars or scope.
- Never handle the nest, eggs or chicks.
- It is generally considered unethical to click photographs of nests and chicks. If you intend to click photographs of nesting birds, do so from a safe distance.
- Potential predators of bird-chicks and eggs like crows, dogs and cats may follow you around while you are walking and observing birds. Please be careful so as to not lead them to nesting areas.
- If possible, wear dull coloured clothes while bird-watching. Avoid strong-odoured powders, creams, perfumes, lotions, etc.

Remember, bird watchers must always act in ways that do not endanger the birds and their surroundings.

Terms used to describe bird behaviour

Here are some of the behaviours that you may observe:

- Feeding: eating food or drinking water.
- Flocking: birds grouping together, either during flying, or while looking for food.
- Flying: the act of staying in the air, by flapping wings or soaring.
- Foraging: the act of searching/looking around for food.
- Mating: the action of birds coming together to breed.
- Nesting: the act of building a nest, which is a structure to hold the eggs and chicks.
- Preening: the act of cleaning feathers by oneself or another bird.
- Bathing: birds immersing themselves in water to clean or cool themselves
- Roosting: a behaviour where birds settle in groups (or alone), at a particular area to rest/sleep.
- Singing or calling: communication between birds.
- Territorial display: the act of protecting a tree branch, a nesting site, or an area on the ground. This could also involve attacking/fighting another bird or animal.
- Walking/hopping/wading/swimming: movement on the ground/in the water.
- Courtship: Various forms of communication like songs, dances, plumage, etc., in an attempt to attract a mate.

Parts of a bird: Some terminology

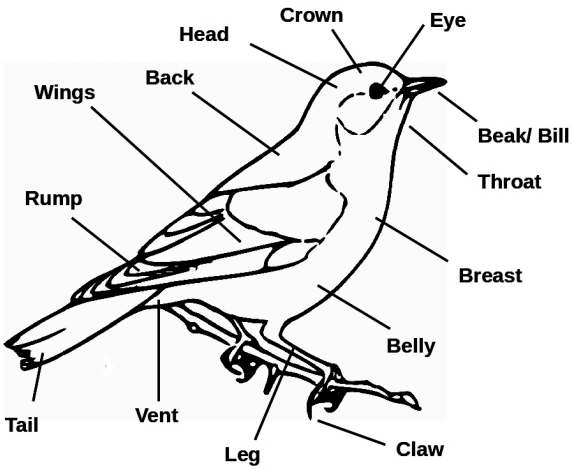

Figure 1 *Parts of a bird*
Adapted from: Pixabay (CC0 Creative Commons)

When you want to describe the bird, use the terms mentioned above for better description. For e.g.: The *bird's throat* was black in colour. It had a white *belly* and a red vent.

Student Handout #2

Task 1: What to do?

(Time: Ten minutes each, in the morning, noon, and evening, for four weeks: individual activity).

- Carefully go through the "Basics and ethics of bird-watching" [Student Handout #1]
- Choose a safe place in the school/near your home, where you notice bird activity.
- For ten minutes in the morning, noon, and evening, spend time observing one species of birds, from your "observation point".
- Write the following header information in your notebook: day, date, time, weather, location, and for how long you carried out your observation activity.
- Observe the birds patiently and quietly. Write down everything the bird does.
- Refer to Student Handout #1 titled "Terms used to describe bird behaviour" and "Parts of a bird". Try to use the terms in your descriptions and drawings.
- Draw the bird, as you see it, and label it. You can also colour it if you would like to. It is alright if your drawing is not beautiful. Focus on drawing what you see.
- If after one week, you are unable to make observations, use the "Observation Guidelines" [Student Handout #3] to make your notes.

Tip: You are free to write the descriptions in your own words, and you can use drawings, illustrations, flowcharts, etc., to make detailed descriptions. Let us say you are observing a House crow and after few minutes, it flies away. Make a note of it and then continue to observe another crow. You are welcome to observe the birds for more than ten minutes also. Write down what you find interesting about the bird or its behaviour.

Task 2: What to do with your data?

(Time: 80-120 minutes, to be done four weeks after the task 1, group work, along with the teacher).

1. Form a group with your friends who observed the same species. Discuss your observations.
2. Use "Guiding questions for task 2" listed in this handout to compile your findings. For example, for each question listed in the "guiding questions", list the observations from all observers.
3. For each question, try to identify the similarities and dissimilarities in your observations across the group.

4. Look for aspects that you would need to make more precise observations for. For example, is the House crow only black in colour? Or is it a combination of grey and black?

Tip: If you think you have less data/notes, then continue your observations for another one or two weeks. Then repeat task 2 with your friends.

Guiding questions for task 2

1. Where did you usually sight the bird (grass, shrub, ground, trees)?
2. Which time of the day did you most often sight the bird? When was it most active?
3. What kind of perch (higher branch, lower branch, ground) did the bird prefer?
4. Did the bird stay in the same spot for long or did it keep changing its location ?
5. What was the diet of the bird?
6. Was the bird social (moves in a group), or usually seen alone?
7. Were the birds always sighted in pairs (male/female or male/male or female/female or with a bird of another species)?
8. Did the bird prefer to be near birds of its own kind (same species)?
9. Did the bird prefer to be near birds of different species?
10. Was the bird very vocal (makes a lot of calls/noise) or quiet?
11. What were the biotic components (other members of the same species, other species of birds, other animals) that the bird interacted with.
12. What were the abiotic components (water body, soil) that the bird interacted with?
13. Did you see any nesting sites? How many of the birds were nesting?
14. Did the silhouette of the bird always appear the same?
15. What were the life forms (birds/animals/reptiles) that the bird seemed to fear?
16. What were the life forms (birds/animals/reptiles) that the bird did not seem to fear?
17. Did the birds fly away if human beings were close by?
18. What was the most interesting observation you noted?
19. What behaviour (foraging, preening) was seen the most often, when observing the bird?
20. Did you see any roosting sites? How many of the birds were roosting?

Task 3: Refining your documentation

(Time: 80 minutes, to be done one/two weeks after task 2: group work, along with the teacher)

1. Work towards refining your documentation. You can add mind maps, flowcharts, flash cards or present your observations in any visual form in addition to your original writing.
2. If you have observed any peculiar or interesting behaviour of a bird, then write a short report on it, giving exact details.

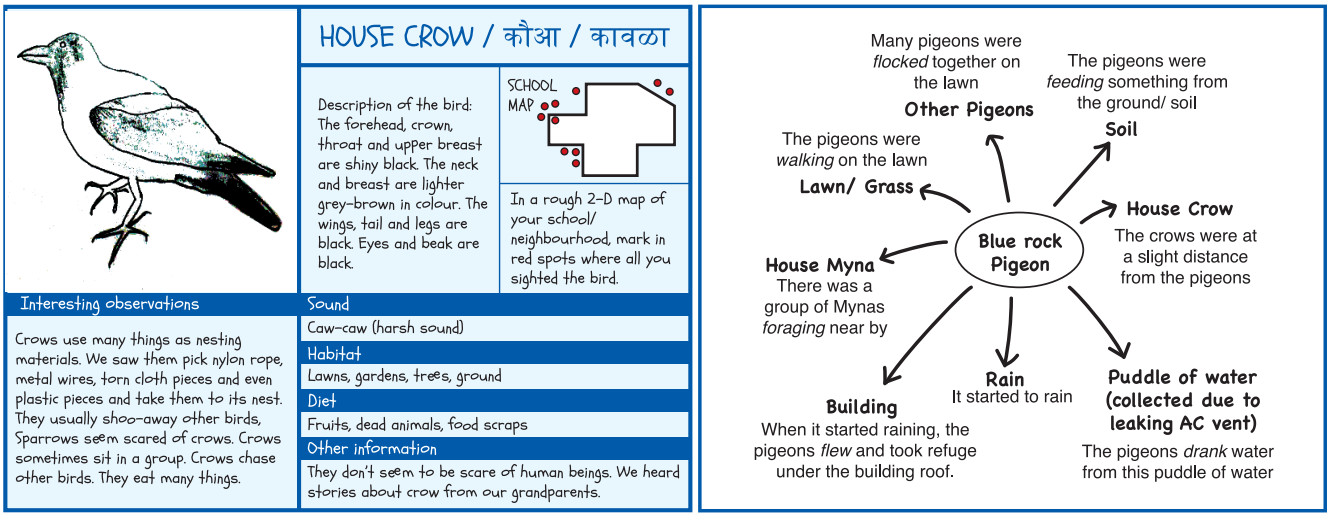

Figure 2 *Templates: Example of a possible flash card (left); an interaction map of a blue rock pigeon (right)*

Important

Your notes should be a reflection of what you observed over four weeks or more. It should not be copied from books or the Internet.

Try to use the new terms that have been introduced in Student Handout #1 (For example, see the italicised words in the above interaction map)

If you think that your data is not enough, continue the observations for a few more weeks.

Student Handout #3

Observation Guidelines (optional)

Write down "who, what, when and where" about the bird you observed.

What was the bird doing?	
Was the bird looking for food (foraging)? If so, where?	Was the bird perched (sitting) or flying?
Did you observe birds nesting? Caution: Never approach a nesting site. Observe from a distance.	Did the bird walk or hop? Do you think the bird could walk/ hop backwards?
Did you see the bird swimming?	Was the bird staring at one place for a long time? If so, where?
How was the behaviour of the bird around the nest? Who was present near the nest? Male/s and/or female/s?	Was the bird cleaning itself (preening) or bathing?
Did the bird seem restless, nervous, calling loudly? If yes, why?	Did the bird take a dip or a dive in the water? How long did it stay under water?
Did you see the bird picking up things (twigs, cloth, plastic, wires, grains, worms, stones)?	Did the bird feed on anything? If so, what was it feeding on?
Do you think the bird was collecting nesting material? If so, what materials?	Did the birds show any signs of "territorial displays"?
Did the bird drink water? If yes, from where?	Was the bird resting in one place?
Did the bird ruffle its feathers?	Did the bird stand on one leg?
Did you observe any peculiar behaviour of the bird?	Was the bird continuously in one place?
Did you see the birds mating? (breeding)	Was the bird sleeping?
Did you see the bird urinate/ excrete waste? Do they do this often?	Did you see the bird fighting? If yes, with whom ? What was it doing to fight?
What did the bird look like?	
Describe what the bird looks like. Try and draw how the bird looks.	How many toes did the feet of the bird have? Draw the arrangement of the bird's toes.
What was the size of the bird?	What's the most prominent feature of the bird?

Do you think it was bigger/smaller than your palm?	What was the colour of the bird? What were the colours of the different parts?
Can you guess the height/weight of the bird?	What was the colour of the bird's eye?
Did the bird try to camouflage itself with its surroundings? If yes, how?	Did all the members of the same species look the same? If not, how were they different?
Describe and draw the shape of the bird's beak. What do you think might be its food?	Could you tell apart the male and the female of the same species? How?
Draw the feet of the bird. What is the shape and colour of the feet?	Did either member (male or female) of the species look more colourful than the other?
Who was the bird with?	**How did the bird sound?**
Was the bird alone or was it seen in a group? Give the group number/size.	Was the bird singing or calling? If yes, describe how it sounded.
Did the bird tend to move in a group (flocking)?	Was the bird continuously making calls?
Was the bird always seen in a pair (male and female, male and male, female and female, or with a bird of another species)?	Assign a mnemonic to the bird's call. (What would it sound like if you wrote it out in English/Hindi?). (Che-che-che, caw-caw, houp-houp)
Did the group comprise of the same species or different species? Describe the interactions within the group.	How was the bird's tone – melodious, sweet, harsh, loud, screechy?
Did the bird interact with or get chased by any other animals (e.g., insect, dog, reptile)?	Did the bird sing when perching, when flying, or both?
Were there any other animals or birds near the bird's nest (if observed)?	Did you find instances where you thought two or more birds were communicating with each other?
Were there any chicks (did you hear them) present?	Did the bird make more than one type of call?
Where was the bird seen?	**When did you see the bird?**
Describe or draw the immediate surroundings of the bird.	Mention the day, date, time, location, and duration of observation.
Was the bird easy to see or did it stay hidden?	Was the bird commonly seen during the day/night?
How long did it take for you to find the bird again?	Was the bird commonly seen through out the day?

How long did you watch the bird? Also mention if you observed the same specimen for the entire duration of observation.	Describe the weather. Was it cloudy/ sunny/ warm/ hot/ dry/ humid/ shade/ cold/ windy? What was the temperature like?
Where was the bird sighted: tree, ground, grass, shrub, waterbody, etc.?	Was the bird more easily seen during morning, afternoon, or evening?
What other signs (evidence) of the bird did you see?	
Did you find any discarded feathers ? Draw and colour the feather you found.	Did you see bird droppings ? (body waste)? Describe it.
Can you guess which body part the feather came from?	If so, what was the colour and texture of the bird's droppings?
Did you see any bird footprints ? If yes, can you guess if this was a land or water bird?	Did you see a nest ? If yes, what was the location of the nest?
Did you spot any other signs that indicated that a bird was there?	Did you see any dead specimen of a bird ? If so, how do you think it died ? Caution: Do not touch dead specimens with bare hands.
What did the bird do at the end of the day?	
Did you find your bird roosting ?	Did it roost alone or in a group?
Did it always roost in the same place/tree? If yes, which one?	If in a group, were the other birds of the same species or a different one?
Describe the bird's roosting behaviour.	Did they make a lot of noise or were they quiet?
Is the roosting site and the nesting site same for the bird?	Did the bird come to the roosting spot at the same time every day or at different times of the day?

Table 1

Note: Feel free to address any other aspects of birds as well. Direct your attention *not only* to the bird *but also* its immediate environment. The above questions are just meant to serve as pointers to initiate your bird observations.

Field Guides

- Ali, S. (2002). *The book of Indian birds* (13th Edition). Mumbai: BNHS.
- Grimmett, R., Inskipp, C., & Inskipp, T. (2011). *Birds of the Indian subcontinent* (2nd Edition). London: Oxford University Press & Christopher Helm.

- Kazmierczak, K., & Ber van Perlo (Illustrator) (2000). *A field guide to the birds of the Indian subcontinent* (1st Edition). London: Pica Press/Christopher Helm.
- Early Bird Pocket Guide by Nature Conservation Foundation (Multilingual).

Appendix

What can human beings learn by studying birds? Why would one want to invest time and energy in such an exercise? How does the understanding of birds enhance our understanding of the world around us? Here are some learning possibilities:

Birds as indicators of the environment

We live in a rapidly changing world. Humans have modified the world's environment in drastic ways, and India is no exception. India's population is the second largest in the world, and its impact on the environment, including the biodiversity, is rapidly increasing. For example, the population of vultures has declined drastically in the recent years because they feed on the carcasses of cattle treated with a veterinary drug Diclofenac (a common drug administered to treat the symptoms of inflammation, fevers, diseases, etc.), which is toxic to the vultures. Following this decline, some studies tried to draw a connection between the increase in the number of stray dogs (which fed on decaying flesh that was now left uneaten by vultures) and the incidences of rabies across India. Birds have also served to warn of environmental dangers. In the olden days, coal-miners used to carry caged canaries (bird) while at work; the canary would die if there was excess methane and/or carbon monoxide, which was poisonous to humans as well.

Today, as some of the best-documented animals on the planet, birds serve as indicators of environmental change; sea bird health informs us about fish populations, for instance. Birds can also tell us a lot about the history of the places they lived in. For example, the beaks of the famous Darwin's finches evolved because of extreme environmental changes. These environmental changes reduced the available food, and the beaks of the birds evolved to consume different foods like tougher seeds, insects, etc. This diversity in the shape of beaks thus, is an indicator of the history of changes in their environment, that is, in Galápagos Islands (in Ecuador). So, by following birds and learning about them, we are trained to notice changes in bird behaviour and their presence and absence. This knowledge is critical to CONSERVE BIRDS and maintain healthy, sustainable human habitation.

Declining sparrow population in India

Sparrows are common across the world and are seen alongside human habitation. But over the last couple of years, people in India started reporting absence or fewer number of house sparrows in their areas. This motivated the Citizen Sparrow Project, a citizen science project spearheaded by Bombay Natural History Society, together with a group of nature and conservation related organisations. They analysed over thousands of reports from all over India and summarised the collected information in the form of a report. Though it was evident that some regions did show dwindling sparrow populations, the reasons for it are still unclear and debated. Based on these results, several initiatives were proposed to increase or restore sparrow populations across the country. To know more, visit: http://www.citizensparrow.in

Birds as teachers

Birds, like many other components of nature, have informed and inspired many human inventions and innovations, and they continue to serve as a source of inspiration for many others. The invention of flight was directly inspired by the capabilities of birds. The simple physics problem of how birds transmit their complex songs is solved in a manner similar to many modern-day information technology systems. The extraordinary diversity of birds is reflected in their diverse beaks, which serve as tools that can probe, crush, filter, etc. They also at times serve as wood-chippers or insect-catchers. In essence, birds have evolved many tools millions of years before humans invented them, solving many simple design problems that we struggle with even today. The eyes of birds possess capabilities that are far superior to those of human beings. Most birds can see colours and portions of the light spectrum that we, human beings, cannot. Falcons can see a small rabbit moving on the ground from hundreds of feet in the air. The possibilities of learning and inventing things inspired by birds are innumerable. The Japanese engineer, responsible for designing of the Shinkansen Bullet Train, was inspired by the beak of a kingfisher (bird) to redesign the front part of the bullet train, which made the train more aerodynamic and energy-efficient.

The role of birds in ecosystems

Although we are commonly taught about birds as pests and eaters of crops, did you know that birds are also a valuable part of a habitat? They play critical roles in maintaining forest ecosystems by eating fruits and dispersing seeds. Birds like Sunbirds (that have thin long curved beaks), Leafbirds, White-eyes, help in pollination, and may thus benefit the

farmer. Many birds eat harmful insects, and serve as biological pest control, protecting crops from harm. Sadly, in the era of pesticides, many farm birds are being poisoned and are disappearing from their regular habitats. How might we save birds on farms, and how does this benefit people? Additionally, some birds can be apex predators while others are scavengers. Their role in the ecosystem food web is of paramount significance.

Lastly, it is interesting to note that many philosophers and scientists who have tried to make meaning of human beings' relationship with nature and all living things, have cited an aesthetic (beauty) dimension to valuing nature. Human beings are often filled with wonder by the physical beauty of nature, and derive a sense of fulfillment and satisfaction when amidst it.

Develop skills associated with scientific literacy

By learning to observe and study birds, a student learns the basic life skills of observation and inference, and paying attention to detail (Do birds of the same species look different? How are they different from each other? Can you tell their songs/sounds apart?). Historically, natural sciences, including astronomy, largely depended on systematic, prolonged, and meticulous observations. Even today, many studies in ethology (science of animal behaviour) are observation-driven. This activity provides a good opportunity to hone those useful skills! Moreover, birds are a part of folk-lore. We also hear phrases like "proud as a peacock", "eagle eye", "wise as an owl", "the clever crow", etc.

Students can also notice the interconnections between a species and its immediate environment. Knowing where and when you find certain birds may encourage school children to learn more about the geography and the climate of the area. It may also encourage an understanding of the various habitats/ecosystems birds occupy, from deserts to rain forests. Finally, because birds are generally conspicuous, beautiful, well-known, and found in almost every corner of the world, they are ideal subjects for undertaking a simple study.

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