

# Eco-Clubs and Water Conservation

**A Handbook for Schools**



**CENTRAL BOARD OF SECONDARY EDUCATION**

Shiksha Kendra, 2, Community Centre, Preet Vihar, Delhi-110092 India



# ECO-CLUBS AND WATER CONSERVATION

**A Handbook for Schools**

**2019**

September, 2019

## **Eco-Clubs and Water Conservation**

A Handbook for Schools

© CBSE, India

All rights reserved. No part of this handbook may be reproduced in any form or by any electronic or mechanical means – except in the case of brief quotations embodied in articles or reviews – without written permission from its publisher.

**Published by:** The Secretary, Central Board of Secondary Education, Shiksha Kendra,  
2, Community Centre, Preet Vihar, Delhi-110092

**Design & Layout:** Sajid Khalil, Sr. Graphic Designer-cum-Visualizer

**Printed by:** SK Print House, D-105, Abul Fazal Enclave-I, Jamia Nagar, Okhla,  
New Delhi-110025



# !! भारत का संविधान !!

## – उद्देशिका –

हम, भारत के लोग, भारत को एक सम्पूर्ण<sup>1</sup> प्रभुत्व संपन्न समाजवादी पंथनिरपेक्ष लोकतंत्रात्मक गणराज्य बनाने के लिये, तथा उसके समस्त नागरिकों को:

सामाजिक, आर्थिक और राजनैतिक न्याय,  
विचार, अभिव्यक्ति, विश्वास, धर्म  
और उपासना की स्वतंत्रता,  
प्रतिष्ठा और अवसर की समता

प्राप्त कराने के लिये,  
तथा उन सब में व्यक्ति की गरिमा  
<sup>2</sup>और राष्ट्र की एकता और अखण्डता  
सुनिश्चित करने वाली बंधुता बढ़ाने के लिये

दृढसंकल्प होकर अपनी इस संविधान सभा में आज तारीख 26 नवम्बर, 1949 ई. (मिति मार्गशीर्ष शुक्ला सप्तमी, संवत् दो हजार छः विक्रमी) को एतद्द्वारा इस संविधान को अंगीकृत, अधिनियमित और आत्मसर्पित करते हैं।

1 संविधान (बयालीसवाँ संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977 से) “प्रभुत्व-संपन्न लोकतंत्रात्मक गणराज्य” के स्थान पर प्रतिस्थापित।

2 संविधान (बयालीसवाँ संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977 से) “राष्ट्र की एकता” के स्थान पर प्रतिस्थापित।

# !! भारत का संविधान !!

## भाग 4 क

## – मूल कर्तव्य –

**51क.** भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि वह-

- (क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्र ध्वज और राष्ट्रगान का आदर करे;
- (ख) स्वतंत्रता के लिए हमारे राष्ट्रीय आंदोलन को प्रेरित करने वाले उच्च आदर्शों को हृदय में संजोए रखे और उनका पालन करे;
- (ग) भारत की प्रभुता, एकता और अखंडता की रक्षा करे और उसे अक्षुण्ण रखे;
- (घ) देश की रक्षा करे और आह्वान किए जाने पर राष्ट्र की सेवा करे;
- (ङ) भारत के सभी लोगों में समरसता और समान भ्रातृत्व की भावना का निर्माण करे जो धर्म, भाषा और प्रदेश या वर्ग पर आधारित सभी भेदभाव से परे हो, ऐसी प्रथाओं का त्याग करे जो स्त्रियों के सम्मान के विरुद्ध है;
- (च) हमारी सामासिक संस्कृति की गौरवशाली परंपरा का महत्व समझे और उसका परिरक्षण करे;
- (छ) प्राकृतिक पर्यावरण की, जिसके अंतर्गत वन, झील, नदी और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करे तथा प्राणि मात्र के प्रति दयाभाव रखे;
- (ज) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करे;
- (झ) सार्वजनिक संपत्ति को सुरक्षित रखे और हिंसा से दूर रहे;
- (ञ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत प्रयास करे जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई ऊँचाइयों को छू ले;

<sup>1</sup>(ट) यदि माता-पिता या संरक्षक है, छह वर्ष से चौदह वर्ष तक की आयु वाले अपने, यथास्थिति, बालक या प्रतिपाल्य के लिए शिक्षा के अवसर प्रदान करे।

1 संविधान (छियासीवाँ संशोधन) अधिनियम, 2002 की धारा 4 द्वारा (1.4.2010 से) प्रतिस्थापित।



# THE CONSTITUTION OF INDIA

## PREAMBLE

**WE, THE PEOPLE OF INDIA**, having solemnly resolved to constitute India into a <sup>1</sup>**SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC** and to secure to all its citizens:

**JUSTICE**, social, economic and political;

**LIBERTY** of thought, expression, belief, faith and worship;

**EQUALITY** of status and of opportunity; and to promote among them all

**FRATERNITY** assuring the dignity of the individual and the <sup>2</sup>unity and integrity of the Nation;

**IN OUR CONSTITUENT ASSEMBLY** this twenty-sixth day of November, 1949, do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

- 
1. Subs, by the Constitution (Forty-Second Amendment) Act, 1976, sec. 2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
  2. Subs, by the Constitution (Forty-Second Amendment) Act, 1976, sec. 2, for "unity of the Nation" (w.e.f. 3.1.1977)
- 

# THE CONSTITUTION OF INDIA

## PART IV A

### FUNDAMENTAL DUTIES

#### ARTICLE 51A

It shall be the duty of every citizen of India -

- (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- (c) to uphold and protect the sovereignty, unity and integrity of India;
- (d) to defend the country and render national service when called upon to do so;
- (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- (f) to value and preserve the rich heritage of our composite culture;
- (g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;
- (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- (i) to safeguard public property and to abjure violence;
- (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;
- \* (k) who is a parent or guardian to provide opportunities for education to his/her child or, as the case may be, ward between age of six and fourteen years.

---

\* Subs, by the Constitution (Eighty - Sixth Amendment) Act, 2002

# ACKNOWLEDGEMENTS

## Patrons

- Shri Ramesh Pokhriyal 'Nishank', Minister of Human Resource Development, Government of India
- Shri Sanjay Dhotre, Minister of State for Human Resource Development, Government of India
- Ms. Rina Ray, IAS, Secretary, Department of School Education and Literacy, Ministry of Human Resource Development, Government of India

## Advisory, Editorial and Creative Inputs

- Ms. Anita Karwal, IAS, Chairperson, Central Board of Secondary Education

## Guidance and Support

- Shri Anurag Tripathi, IRPS, Secretary, Central Board of Secondary Education
- Dr. Joseph Emmanuel, Director (Academics), Central Board of Secondary Education
- Dr. Biswajit Saha, Director (Skill Education & Training), Central Board of Secondary Education

## Writer, Editor, Curator and Co-ordinators

- Dr. Sweta Singh, Joint Secretary (Academics), Central Board of Secondary Education
- Dr. Girish Choudhary, Retd. Associate Professor, Lady Irwin College, New Delhi

## Reviewers

- Dr. Praggya M. Singh, Joint Secretary, (Academics), Central Board of Secondary Education
- Shri Al Hilal Ahmed, Joint Secretary, (Academics), Central Board of Secondary Education

## Contributors

- Dr. Sweta Singh, Joint Secretary (Academics), Central Board of Secondary Education
- Dr. Girish Choudhary, Retd. Associate Professor, Lady Irwin College, New Delhi
- Ms. Livleen Kahlon, Associate Director, Environmental Education & Awareness, TERI
- Ms. Mangala Dubey, Founding Director, Green Edu
- Dr. Swati Kwatra, Asst. Professor, Lady Irwin College, New Delhi
- Ms. Neelam Gautam, PGT, Biology, Step By Step School, Noida
- Shri B. C. Sabat, Retd. Senior Scientific Officer, Dept. of Environment, Govt. of NCT

## Editorial Support

- Ms. Princi Verma

## Contributors of Poems

- Ms. Shivani Mehta
- Dr. Renu Mishra
- Ms. Mamta Rajnish





# PREFACE

The formidable challenges of environmental degradation and climate change are confronting human civilization. Environmental concerns worldwide are receiving a high priority because of problems such as global warming, dwindling water supply, pollution of the water bodies, air and land, the declining bio-diversity and the degradation of land leading to conditions like drought, famine, floods and other disasters. The global dimension of environmental problems needs a concerted, committed and collective response, especially from education.

Environmental issues have been the key focus of CBSE which has taken various initiatives to sensitize schools and students to emergent environmental concerns like energy conservation, wastage of food at social gatherings, hazards of electronic waste, conservation of petroleum products, plastic pollution etc. Various eco-events like school waste audit on World Environment Day and painting competitions on energy conservation are being conducted regularly.

The Board has published *Teacher's Manual on Environmental Education* with several activities for students to relate the basic principles of environment and ecology with their day-to-day experiences.

It has been felt that CBSE schools must respond more proactively to the issue of **Water Conservation** (*Jal Shakti Abhiyaan*). The board proposes schools to mandatorily create Eco-Clubs and strengthen them wherever they already exist. While Eco-Clubs would continue to promote environment and climate literacy and motivate learners to become champions for environmental sustainability, the thrust of this year's activities will be on water conservation. It is hoped that Eco-Club members would advocate, participate in grass-root movements to take actions to sustain water and encourage students to adopt ecofriendly practices to save the planet. Eco-Clubs are, thus, being viewed as a platform for the achievement of Sustainable Development Goals. They would empower students to participate and take up meaningful activities and projects, engage their parents and enlighten neighborhood communities to promote sound environmental behavior.

# TABLE OF CONTENTS

<b>Acknowledgements</b>	<b>iii</b>
<b>Preface</b>	<b>v</b>
<b>Table of Contents</b>	<b>vi</b>
<b>Outcomes</b>	<b>x</b>
<b>Context</b>	<b>1</b>
<b>SECTION I - Eco-Clubs – Agenda for Schools</b>	
<b>1.1 Eco-Clubs in School</b>	<b>9</b>
1.1.1. What is an Eco-Club?	9
1.1.2. Objectives of an Eco-Club	9
1.1.3. Policy of CBSE on Eco-Clubs	9
1.1.4. How to setup an Eco-Club?	9
<b>1.2 Sustainable Schools – An Inspiration for Eco-Club Activities</b>	<b>14</b>
1.2.1. Why is Sustainable Development important for schools?	14
<b>SECTION II - Conservation of Water – Agenda for Schools</b>	
<b>2.1 Water- A Precious Resource</b>	<b>21</b>
<b>2.2 Meeting the Challenge</b>	<b>22</b>
<b>2.3 What can Schools do?</b>	<b>23</b>
<b>2.4 Goal: Be a Water Efficient School (Institutional Responsibility)</b>	<b>23</b>
<b>2.5 Goal: Engage Students, Parents and Community in Water Conservation Efforts</b>	<b>24</b>
2.5.1. Water literacy/education through the curriculum	24
2.5.2. Organize Water Conservation Education workshops	25
2.5.3. Motivate students to conserve water by engaging them in various activities	25
<b>2.6 Reach out to the Community</b>	<b>33</b>

## **SECTION III - Suggested Activities**

### **3.1 Suggested Activities: Primary Level (Classes I-V) 39**

3.1.1. Activity 1 – Segregation of Waste 40

3.1.2. Activity 2 – Becoming a Wildlife Explorer 41

3.1.3. Activity 3 – My Scrapbook 42

3.1.4. Activity 4 – Waste Free Tiffin boxes 43

### **3.2 Suggested Activities: Middle Level (Classes VI-VIII) 45**

3.2.1. Activity 5 – Swachhta Pakhwada in Schools 46

3.2.2. Activity 6 – Bird Box Building 47

3.2.3. Activity 7 – Creating a School Herbal Garden 49

3.2.4. Activity 8 – My Vertical Garden 50

3.2.5. Activity 9 – The Leaf Safari Day 51

### **3.3 Suggested Activities: Secondary Level (Classes IX-X) 53**

3.3.1. Activity 10 – Our Butterfly Garden 54

3.3.2. Activity 11 – Visit to a Wetland 56

3.3.3. Activity 12 – Pollen, Pollen, Everywhere. 58

3.3.4. Activity 13 – Water Conservation 59

### **3.4 Suggested Activities for Senior Secondary Level (Classes XI-XII) 62**

3.4.1. Activity 14 – E-waste Drive 63

3.4.2. Activity 15 – Awareness Drive on Reuse of Grey Water 64

3.4.3. Activity 16 – Calculating Carbon Footprint 65

3.4.4. Activity 17 – Green Living Quiz 67

## **References 71**

## **Annexure I - Environmentally Important Days 75**

# OUTCOMES

While schools strive to model eco-friendly practices, students can become powerful proponents of environment conservation. **Eco-Clubs programmes in schools that specifically focus on water conservation** for the current year are an ideal way to guide learners on a meaningful route towards environmental protection. As there is a special focus on conservation, the learners would:

- Be motivated to adopt practices that conserve water.
- Be familiar with the rich biodiversity the earth is blessed with and look into the challenges faced by our environment.
- Imbibe respect and care for our surrounding and environment.
- Develop green consciousness and realize the importance of environment conservation.
- Demonstrate the use of eco-friendly practices.
- Participate and take up purposeful activities and projects for environmental protection and conservation.
- Enhance key life skills viz. problem solving, critical and creative thinking etc. as they engage in resolving local environmental problems.

# CONTEXT



# CONTEXT

Globalization, rapid industrialization and liberalization of economy have intensified environmental concerns and led to numerous environmental challenges. The growth of human population, its needs and scientific and technological advancements have accelerated the pace of environmental degradation. Diminishing forests, loss of fertile soil, industrialization and indiscriminate use of natural resources has led to depletion of mineral resources, extinction of several living species and growing pollution resulting in environmental crisis. Unchecked, it may endanger the very existence of human beings itself. As we move ahead on our path to development, it is our moral duty to simultaneously protect the environment.

United Nations Environment Programme (UNEP, 2006) observed that world is experiencing more serious threats than ever before due to unsustainable use of natural resources. **According to Millennium Ecosystem Assessment done by UNEP (2005), 60% of the earth's ecosystem services and goods are being degraded or used unsustainably.**

Thus, there is an urgent need for everyone to be aware of the environmental challenges that we face today and become environmentally conscious citizens. The children, especially, need to be equipped with appropriate skills to address and take necessary action on environmental issues in pursuit of a better quality of life in the new millennium. This is possible through a change in attitudes which occurs when people are knowledgeable about the environment and its associated problems; are aware of the solution to these problems; and are motivated to work towards these. Education has always played an instrumental role in disseminating knowledge, providing necessary skills and helping form positive attitudes.

The connect with nature is an integral part of Indian culture and civilization epitomized by practices like worship of flora, fauna, rivers, oceans and mountains. Man has lived in harmony with nature and the concept of divinity in all forms, not only human, is pervasive and a distinctive feature of India's spiritual life. The need to preserve the environment and protect it from degradation is an integral part of the social fabric of India and emphasis for this has been laid down in ancient Indian scriptures like Vedas, Puranas and the Upanishadas.

The tradition of respecting natural resources has been reaffirmed and reiterated by the provisions laid down in the Constitution of India. The Directive Principle of State Policy, Article 48-A states: *'The state shall endeavour to protect and improve the environment and safeguard the forests and wildlife in the country.'* Fundamental Duties-Article 51-A (g) further underlines: *'it shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.'* The responsibility of the state and its citizens to protect and conserve environment is thus ensured. The landmark judgement of the Hon'ble Supreme Court of India in response to a public interest litigation (2002) draws attention of teachers, parents and students to environment education and makes it obligatory for the States and UT to comply with the implementation of environmental aspects through education.

'Environmental Studies' at the primary level was initially recommended in the teaching policy document, 'The Curriculum for the Ten-Year School: A Framework (1975)'. The paramount need to create a consciousness of the environment for all ages and all sectors of society, beginning with the child has been acknowledged by the National Policy on Education (NPE, 1986). Protection of environment as a value is visualized as an integral part of the curriculum at all stages of education. The NCERT's 'National Curriculum for Elementary and Secondary Education: A Framework (1988)' positioned that the school curriculum should highlight measures for protection and care of the environment, prevention of pollution and conservation of energy. Environmental studies was then introduced as a subject at the primary level.

The establishment of the Center for Environmental Education (CEE) in 1984, provided a great push to environmental education. The centre started various initiatives for the integration of environmental education at various grades within schools. The Supreme Court mandates (1991 and 2003) provide the needed impetus for policy formation as evidenced in the National Curriculum Framework (NCERT 2005). Notable work has been done by organizations like Institute of Environmental Education and Research, Bharatiya Vidyapeeth (BVEER) and Center for Environment Education (CEE) towards educating teachers to teach environment education.

The Decade of Education for Sustainable Development launched by United Nations in 2005 aimed at integrating the principles of nurturing sustainable development. The 'whole school' approach as recommended by NCF, 2005 and other measures to engage students proactively in activities and measures for environmental conservation is the call of the day.



# SECTION I

**ECO-CLUBS**

**Agenda for Schools**



# जीवन स्रोत पर आघात

प्यासी धरती रही पुकार  
बिना नीर हो रहा हाहाकार  
बूँद-बूँद को तरसी आँखें  
कैसे खिलें फूल की पाँखें?

सूखी नदी, सूखे खेत-खलिहान।  
कभी यहाँ बसता था जीवन गान  
अपने ही जीवन स्रोत को दिया मार,  
भूल गए रचयिता का आभार।

जल ही है जीवन का स्रोत  
परन्तु हमने ही किया उसका अवरोध  
सहना ही पड़ेगा सृष्टि का प्रकोप  
जल ही जीवन का आधार  
उसी पर कर दिया हमने वार।

कलयुग में कुछ ऐसा बसा संसार  
जहाँ न बादल, न बरखा का अवतार  
ऊँची इमारतों ने रोका इसका बहाव  
पानी भी बिका सोने के भाव।

कहाँ मैं कागज़ की कश्ती चलाऊँ?  
किस हैंडपम्प के नीचे नहाऊँ?  
किस घाट पे तुझे बुलाऊँ?  
सब सूख गया इस घने वन में  
ये दरारें कहाँ छुपाऊँ?

चलो आज करें एक वादा  
सच्चा और सादा  
नहीं करेंगे आघात  
बचाएँगे हर बूँद साथ-साथ।

शिवानी मेहता

# Attack on a life giving resource

An ailing, parched planet calls out for help  
There is complete annihilation in sight without this life giving elixir,  
My eyes yearn for those iridescent drops  
and for the flower petals to bloom.

Dried up river beds and dried up farmlands all around ,  
At one point they echoed the melody of life.  
We have attacked the very essence of our existence.  
Maybe we have forgotten the kind blessings of the creator.

Water is the basis of all existence  
Without this life giving elixir, there would be complete destruction.  
It is the main component that constitutes the human body.  
And what have we done? Struck at the very core.

In these times, what kind of a world have we created?  
A world which has no clouds in the sky and no raindrops falling on the ground.  
A concrete jungle has taken over, stopping the growth of everything else.  
In these times, even a God given resource is sold at the price of gold!

Where should I play with my paper boats?  
Under which hand pump should I bathe?  
On which bank should I call thee?  
All are dried and barren.  
How shall I hide these cracks on my being?

Let's take a vow today  
A simple and pure one.  
Let's not strike at the very core of our existence.  
And save every precious drop.

Translated by

**Ms. Shivani Mehta**

## 1.1 Eco-Clubs in School

### 1.1.1. What is an Eco-Club?

- An Eco-Club is a group of school students interested in environmental issues and willing to make significant contribution to society.
- Under its aegis, students explore environment, understand its concepts and challenges, and take appropriate actions to conserve and protect it. They sensitize their peers, school authorities, parents and community about environmental problems through club activities.

### 1.1.2. Objectives of an Eco-Club

- Create awareness and sensitivity about various environmental issues;
- Develop skills, positive attitudes and ethics towards environment;
- Demonstrate initiative to analyze environmental problems, suggest and implement suitable solutions and follow up actions for these;
- Engage learners in scientific enquiry and;
- Reduce the ecological footprint of the school.

### 1.1.3. Policy of CBSE on Eco-Clubs

Para 14.26 of the Affiliation Bye-Laws, entitled “Environment Education” states as follows:

- “The school must strive to promote conservation of environment on their campus through rain water harvesting, segregation of waste at source, recycling of organic waste, proper disposal of waste including electronic waste, use of energy saving and energy efficient electrical equipment, greening of campus, use of solar energy, education and awareness amongst children on environmental conservation and cleanliness, etc.
- The annual report of the school must contain a write up on all efforts made in this regard every year.”

**In accordance with the stipulations in the Affiliation Bye-Laws, it is mandatory for every school to set up Eco-Clubs and ensure participation of learners across all levels – primary, middle, secondary and senior secondary.**

### 1.1.4. How to setup an Eco-Club?

The guidelines provided below are only indicative. The school may include or delete some steps as per its requirement or situation.

### Step 1: Enrolling members of the Eco-Club

- Eco-Clubs are predominantly student-led with teacher(s) guiding the process.
- If the school is co-educational, the club should include both boys and girls.
- If there are large number of students in a school, there can be separate Eco-Club wings for every level - i.e. primary, middle, secondary and senior secondary. However, some activities overlap and can be clubbed together.
  - » For Primary Level: Students from classes III-V
  - » For Middle Level: Students from classes VI-VIII
  - » Secondary Level: Students from classes IX-X
  - » Senior Secondary Level: Students from classes XI-XII
- In case of different levels of Eco-Clubs in school, one senior teacher may be made convener in order to bring coherence in the activities being performed by each group.
- Since students from primary classes may require guidance, the club must ensure mentoring and guidance of younger students by senior students.
- Other school staff may be included as members depending on the activity.
- Experts can be invited to give a talk or demonstration.

### Step 2: Teacher- Student ratio in an Eco-Club

- An Eco-Club should preferably not have more than 1:20 ratio – one teacher to 20 students. It could be class wise, or cutting across classes.
- This ratio is only a suggestion, as it will help in better management of the club activities. It allows students to work in groups and participate equally.
- If the number of students is significantly large, the club can be divided into wings/groups and a teacher assigned to each group.
- A core group of teachers and students may be created and students may be given designations (president, secretary, treasurer etc.).

### Step 3: Functioning of an Eco-Club

- Eco- Club members should meet at least once a week.
- Minimum duration for conducting an Eco-Club activity would be around 30 minutes but it can be extended depending on the activity.

- Eco-Club activities can also be integrated with the curriculum and classroom transactions can be based on such activities through experiential pedagogy. This will also prevent conflict with other schoolwork or after-school responsibilities.

#### Step 4: Activities to the undertaken and their preferred location

- Eco-Club students can prepare a yearly calendar of activities with the help of their teacher at the beginning of the academic session.
- The **most important activity** undertaken this year would be that each child in the school will be made aware of the **ways in which water can be saved/conserved** through the Eco-Club members. Following this awareness generation, **each child of the school shall help in saving 1 litre of water a day in school or at home**, by adopting various ways/methods. **The Eco-Clubs can give certificates to best performing students.**

**Table 1.1 Saving of Water**

What we do	What should be done	Saving of water
Bathing with shower 100 litre	Bathing with bucket 18 litre	82 litre
Bathing with running water 40 litre	Bathing with bucket 18 litre	22 litre
Using old style flush in latrines 20 litre	Using new style flush 6 litre	14 litre
Shaving with running water 10 litre	Shaving by taking water in mug 1 litre	9 litre
Brushing teeth with running water 10 litre	Brushing teeth by taking water in mug 1 litre	9 litre
Washing clothes with running water 116 litre	Washing clothes with bucket 36 litre	80 litre
Washing car with running water 100 litre	Washing car with wet cloth 18 litre	82 litre
Washing floor with running water (15'x10') 50 litre	Washing floor with wet cloth 10 litre	40 litre (per 150 sq.ft. area)
Washing hands with running tap 10 litre	Washing hands with mug 0.5 litre	9.5 litre

*Source: General Guidelines for Water Audit and Water Conservation, Central Water Commission Government of India, Ministry of Water Resources, December 2005, New Delhi*

- Other activities should include celebration of important environment days like World Environment Day, Water Day, Earth Day etc. (refer to Annexure I); field visits; interactive sessions with experts; action research projects; games, quizzes; awareness raising rallies etc. on important environmental issues. Encourage learners to come up with other innovative ideas and activities.
- Activities can be conducted indoor i.e. in the classroom and outdoors like in the school garden, school playground, neighborhood, community etc.

- Field trips can be organized by the Eco-Club teacher/coordinator to provide experiential learning to its students. Students of similar age-group/classes may be clubbed for this. Supervision by coordinating teacher is mandatory for such exercises.
- Schools may promote the practice of **celebrating the birthday of each student by planting a tree at home or in the neighborhood locality** and encourage them to share the experience with the whole class.
- *The CBSE One Child, One Plant Campaign-2019*, where every student of all CBSE affiliated schools will plant a sapling at place convenient to him/her. Schools will further motivate the child to look after the sapling he/she has planted.
- Certificates can also be given by schools to appreciate the core group for the work carried out by them.

- » **It is mandatory for every child in classes 5 to 12 in every school affiliated to CBSE to take up the activity of saving a litre of water every day at home or in school.**
- » **For this, it is the school's responsibility to create awareness not only in every student, but also in teachers, staff and parent community.**
- » **It is also the school's responsibility to encourage this activity through teacher monitoring, incentives/awards/recognition in any form.**
- » **For classes 1 to 4, it is mandatory to take up fun activities to sensitize them regarding the need to conserve water.**
- » **Aside from the mandated activities, Eco-Clubs must take up several other activities as decided by the student members of the Clubs. Please see Section III for suggested Eco-Club activities.**

### Step 5: Draw an action plan

Students with the help of their teacher should identify issues that need attention either in the school or community or in general.

- Create an action plan based to resolve a problem or improve a situation
- Make an implementable action plan embedded with experiential activities for the club members.
- The action plan should clearly state the time (month, date), content (objective, subject, methodology, materials needed, expected outcomes), individuals responsible (names of students), and place (where to conduct the activities).



- The action plan must be supported and approved by the Eco-Club teacher and the school authorities.

### Step 6: Assessment of activities

**An Eco-Club is successful only when it brings about a change in behavior and attitudes and when an environmental condition is improved.** Eco-Club activities have to be feasible and require regular monitoring and evaluation. It is important for the Eco-Club coordinator to check if the targets set by the club students are being successfully met. Progress has to be monitored and measured regularly.

**For senior classes, teachers can also involve students in the monitoring and evaluation process.** By reviewing the Eco-Club activities, one can periodically modify and make changes to the action plan, if required.

An Eco-Club teacher can use some of the following suggested criteria to evaluate activities.

- Number of club members participating in the activities.
- Actual time taken to conduct an activity vis-à-vis the time planned for the activity.
- Whether students find the activity interesting and fun. If not, then, why?
- Whether an activity helps students to understand the issue at hand?
- Whether the activity encourages practical action for the environment?
- Is discussion encouraged immediately after the activity? Whether students can draw inferences and give workable conclusions?

It is best to evaluate each activity, immediately after it is over.

### Step 7: Documentation of the activities

- While conducting activities, students must be encouraged to maintain a notebook, record observations, take pictures and make videos wherever relevant.
- Share results of activities on school notice boards, school newsletter, website, school's social media handle, during morning assembly, local newspaper, radio/TV etc.

### Step 8: Enter progress in the App to be prepared by CBSE

The Board will prepare an App and inform schools through a circular. This App will monitor the progress made by the Eco-Clubs established in the school in terms of mandatory activities and other activities undertaken by the members of the club.

## 1.2 Sustainable Schools – An Inspiration for Eco-Club Activities

The modern concept of sustainable development is derived mostly from the 1987 Brundtland Report, which defines sustainable development as *'development that meets the needs of the present generation without compromising the ability of future generations to meet their needs.'*

### 1.2.1. Why is Sustainable Development important for schools?

Sustainable development promotes prosperity, economic opportunity, social well-being and protection of the environment. School is the best place to inculcate sustainable development practices. Investing in children is also an investment for our future. Young people can create a dynamic force for change and social transformation when they are made aware of their responsibilities.

Sustainable schools are great places to learn. They enhance personal growth, build confidence, autonomy, leadership and develop life skills like critical thinking. They also improve academic performance of students. Sustainable schools are committed to save energy, conserve water, adopt best practices to manage waste, promote personal hygiene and cleanliness of both students and the school at large and help students become compassionate citizens.

The following doorways are some entry points through which schools can establish their sustainability practices. Each doorway draws its inspiration from a range of national priorities around sustainable development.

Themes/Aspects/ Focus Areas	Recommended activities for all schools
Water	<ul style="list-style-type: none"> <li>• School water use audits</li> <li>• Rainwater harvesting structures</li> <li>• Other indigenous methods of water conservation,</li> <li>• Use of water saving devices/taps</li> <li>• Ensuring no leakages in plumbing, pipes etc.</li> <li>• Recycling of water from RO plants etc.</li> <li>• Drip irrigation structures for school gardens etc.</li> <li>• Testing the quality of water</li> <li>• Taking up water conservation activities in nearby communities</li> </ul>
Energy	<ul style="list-style-type: none"> <li>• Renewable energy sources such as solar panels</li> <li>• Energy Audits</li> <li>• Use of energy efficient lights</li> </ul>

Themes/Aspects/ Focus Areas	Recommended activities for all schools
Waste Management	<ul style="list-style-type: none"> <li>• Measures for minimization of waste</li> <li>• Increasing value by reducing, reusing and recycling as much as possible</li> <li>• Paper recycling and papier mache artwork from waste paper</li> <li>• Setting up no littering zones and no plastic zones</li> <li>• Electronic waste management</li> <li>• Segregation of waste and Composting</li> </ul>
School Ecosystems	<ul style="list-style-type: none"> <li>• Wherever possible include spaces for setting up garden – herbal / floral/ vegetable</li> <li>• Space for installing structures like solar panels, rainwater harvesting etc. in the school building that visibly show sustainable practices</li> <li>• Vertical gardens (where land is unavailable for gardening)</li> <li>• Use of drought prone/ native plants/ trees</li> <li>• Reuse of wastewater from drinking water source for gardening</li> </ul>



# SECTION II

## Conservation of Water Agenda for Schools



*Once you carry your own water,  
you will learn the value of every drop.*



# जीवनदाता पानी

बूँद-बूँद से घट भरता है  
बूँद-बूँद हो जाता खाली  
हम सबको है इसे बचाना  
है अनमोल बहुत ये पानी

पशु-पक्षी हों, पेड़-पौधें हों  
सबका जीवन दाता पानी  
मानव जीवन इसी से चलता  
हम सबका रक्षक है पानी

दो प्रतिशत ही है धरती पर  
इसकी रक्षा सबकी जिम्मेदारी  
नदियाँ हमारी जल-वाहिनी  
मीठा जल हम तक पहुँचातीं

हैं धरती की जीवन-रेखा  
इन्हें बचाना हमारी जिम्मेदारी  
प्रदूषित ना ये होने पाएँ  
जल से भरी ये बहती जाएँ

कल-कल मुदित जो ये बहेंगी  
हरी-भरी धरती भी हँसेगी  
बादल झूमेंगे पर्वत पर  
झम-झम छम-छम बरखा बरसेगी

ललित हरी धरती लहकेगी  
आओ हम सब प्रण करते हैं  
जल को व्यर्थ न बहने देंगे  
गंदा इसे न होने देंगे

सबका जीवनदाता पानी  
इसे बचाना हमारी जिम्मेदारी।

डा. रेणू मिश्रा

# Life Giving Water

Each droplet fills the ocean  
And each droplet empties it.  
All of us should save this precious resource.

As it is the elixir of life for all flora and fauna.  
And all human life depends on it.  
It is our saviour.

As only two percent of it is drinkable  
Saving it becomes a collaborative effort.  
Rivers are the leading arteries that carry fresh water to all.

Protecting these lifelines is our primary responsibility.  
They should not be polluted and should remain free flowing.

For when the waters dance and bend around the river beds freely  
The earth will glow with joy  
And the clouds will pour iridescent rain drops to rekindle green pastures.

Let's all pledge not to waste this resource or let anyone pollute it.

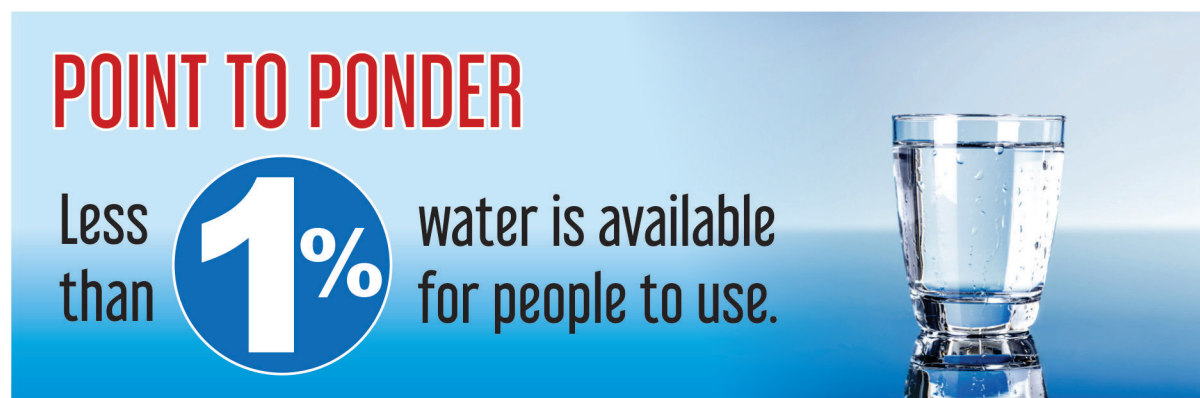
For saving this life giving resource is our duty.

Translated by  
**Ms. Shivani Mehta**



## 2.1 Water-A Precious Resource

Water is one of mankind's most precious resource. Although, 75% of the earth is covered with water, 97% of it is saline. Out of the 3 % available fresh water, 2% is frozen in glaciers, ice and snow; 0.75% exists as fresh ground water and less than 0.01% of it is present as surface water in lakes, swamps and rivers.



The lack of fresh water resources to meet water demands affects every continent and was listed in 2019 by the World Economic Forum (WEF) as one of the largest global risks in terms of potential impact over the next decade. According to UN Human Rights Report (2019), the world is fast approaching 'climate apartheid' where only the wealthy can afford this basic resource in the face of fatal droughts, famine and heat waves.

India is also facing unprecedented challenge of water management in the 21st century. Water tables are getting depleted in most parts of India. According to the Composite Water Management Index (CWMI) report released by the NITI Aayog in 2018, 21 major Indian cities (including Delhi, Bengaluru, Chennai and Hyderabad) will run out of ground water (reach Zero ground water level) by 2020, affecting around 100 million people. According to data, around 12 percent of India's population is already living the 'Day Zero' scenario, a result of wasteful water management practices, deficient rains and excessive groundwater pumping. A shocking 600 million people face 'high to extreme water crises'. The CWMI report informs that by 2030, the 'water demand of the country is projected to be twice the available supply, leading to severe water scarcity for hundreds of millions of people, culminating in an estimated eventual 6% loss in the country's GDP'.

Overexploitation of ground water; lack of water management leading to unequal distribution and availability; wastage of water; and loss of wetlands, water bodies and even rivers to encroachment to meet the needs of rising population are major contributing factors to the current water crisis.

In case of India, demand is not the biggest issue. Arithmetically, India is still water surplus and receives enough rainfall to meet the needs of over one billion plus people. As per Central Water Commission, India needs a maximum of 3,000 billion cubic metres of water a year while it receives 4,000 billion cubic meters of rain. **Too much water is wasted due to inefficiency to conserve and misuse.** Also, as the world warms up, the rain patterns have become erratic. They either fail to arrive on time or fall in a more disparate and unpredictable pattern. We can no longer afford to waste this dwindling resource—water.

## News Article- India Today

**As a relief measure, Chennai, which has been facing acute water crisis, started the first water wagon from Jolarpettai in Vellore district.**

**The wagon carrying 2.7 million litre daily (MLD) of water will reach Villivakam railway station. . . Officials said four trips will be made daily with the city receiving nearly 11 MLD water every day for the next six months.**

*News article/ 11 July 2019 Sourced from*

<https://www.indiatoday.in/india/story/chennai-water-crisis-1566784-2019-07-11>

*Every drop of water is precious.*

Water conservation, water harvesting and mechanisms for ground water replenishment are crucial to let India survive water crisis. Ground water that is steadily depleting for years makes up for about 40% of the country's water supply. Almost two third of India's reservoirs are running below normal water levels. If the current pattern of water use continues, about half of our demand for water will be unmet by 2030.

## 2.2 Meeting the Challenge

Inspired by the Hon'ble Prime Minister impetus on 'Jal Sanchay', Jal Shakti Abhiyan (JSA), a time bound mission mode campaign has been launched for water conservation. The focus of this would be accelerated implementation of five targeted interventions/thrust areas viz. water conservation and rain water harvesting; renovation of traditional and other water bodies; reuse of water and recharging of structures; watershed development, and intensive afforestation. JSA aims at making **Water Conservation a 'Jan Andolan' (people's movement)** through asset creation and extensive communication.

**Water conservation** is conceded most beneficial for reduction in water usage and wastage. It is proven to be the most economic and environmental protective management system for meeting water supply challenges. We all have a role in responsible water usage, helping secure water supplies and create a greener and more livable environment for the future. In reality, all water conservation efforts depend on public awareness and understanding of the need for conservation.

**The potential of schools and their key stakeholders- the students in particular to be the champions and leaders in water conservation needs to be tapped. Educating students to be environmentally conscious citizens becomes important so that they can play an active role in the future.** What we teach students not only impacts their behavior but also the people outside the classroom (friends, relatives, communities) through sharing of information they learn in school.

## CBSE AGENDA FOR SCHOOLS

While schools use tremendous amount of water every day and require water for drinking purposes, rest rooms, canteens, laboratories, outdoor for playing fields, lawns and gardens; it must be understood that conserving water helps to reduce a school's carbon footprint.

A school that conserves water is modeling practices that are being taught at school. **Becoming a water efficient school is hardly a choice any more, therefore, it is mandated for all CBSE schools to achieve the goal of becoming a water efficient school within the next three years.**

The hallmark of a water efficient school would not only be reflected in infrastructure, but also majorly in the manner of use of water by the school stakeholders and their sensitivity towards water conservation.

### 2.3 What can Schools do?

- A. Be a **Water Efficient School** - reflect on their water usage practices
- B. Become the fulcrum of efforts for water conservation by energising students, parents and the community at large.

### 2.4 Goal: Be a Water Efficient School (Institutional Responsibility)

- **Constitute a School Water Management Committee** that may include administrators, teachers, students, non-teaching staff, parents and a few members from the community. The committee would be responsible for efficient use of water in the school; periodic reviews and monitoring water usage to check for wastage and inefficiency; and adoption of water conservation measures.
- **Conduct a Water Audit:** Understand the water consumption of school (how much water is used at various spaces for different activities). This information will help to set benchmarks and prepare a water efficiency plan; identify infrastructure improvements and better irrigation practices for green spaces in the school; and monitor the habits, practices and processes of school personnel's water usage.
- **Adopt a Policy of Water Management** that would entail
  - » Replacing old fixtures and appliances with water efficient models

- » Installing automatic taps with sensors, taps with nozzles/ aerators to cut water wastage
- » Installing double flush toilet tanks on priority
- » Instituting procedures/mechanisms of regular checkups for leakage and their prompt fixing.
- » Installing rain water harvesting structures/systems
- » Planting native and drought tolerant plants, use non-potable water, drip irrigation, timers, rain sensors and other water conservation practices for irrigation of green spaces.

## 2.5 Goal: Engage Students, Parents and Community in Water Conservation Efforts

### 2.5.1. Water literacy/education through the curriculum

- Teaching our children the importance of water conservation is the first step in promoting a deeper understanding of the need to safeguard water supplies for the future.
- Increasing water literacy is important to make students aware of how best to use it and become more efficient in their water use practices.
- Introducing students to water topics is the best way to help them understand and appreciate this valuable resource.
- The curriculum must be examined and current teaching on water topics be expanded to inform student about different sources and their appropriateness for different uses, water treatment and processing, water distribution system, sewage and storm water system, recycling of water and ways to protect it in our rivers, lakes and other water bodies.
- Students can be made to visit a water treatment plant in the area to witness water processing and other places where conservation practices are being adopted.
- Integration of relevant water conservation messages can be done when teaching different subject viz.
  - » When teaching water borne diseases in Science, emphasize plugging all leakages is not only important for preventing spread of diseases but also for water conservation.
  - » When teaching calculation of volume in Mathematics, the implications of proportionate increase in flow with change in diameter can be highlighted to focus on the



need to maintain low flow taps to avoid wastage of water.

### 2.5.2. Organize Water Conservation Education workshops

- The schools can organize in-house workshops on important days like Earth Day, Water Day etc. Science teachers or any other teacher can organize these workshops for students to emphasize the need for water conservation and measures for the same.
- Governmental organisations like Krishi Vigyaan Kendra, Vigyaan Prasar and several voluntary sector organisations like Janaagraha, Centre for Environment Education (CEE) and TERI are doing committed work for conservation of water. They can be invited to organize workshops for staff and students.

### 2.5.3. Motivate students to conserve water by engaging them in various activities

#### 2.5.3.1 Sparking curiosity

Reducing water consumption really begins when students truly understand why they need to conserve water. Motivating students to conserve water is crucial so that it becomes a habit with them. Focusing on the importance of water for personal use, teachers can engage with students by asking simple interesting question like

***How long could they survive without water?***

***How long could they survive only with water?***

***How much water do their bodies have?***

***If there is water scarcity, how will it affect their personal lives, health, mental alertness, etc.***

**Table 2.2 Typical Uses of Water**

Drinking	4%
Cooking & other kitchen uses	8%
Personal hygiene	29%
Washing clothes	10%
Toilet flushing	39%
House cleaning/Gardening etc.	10%

**Source:** *General Guidelines for Water Audit and water conservation, Central Water Commission, Government of India, Ministry of Water Resources, December 2005, New Delhi*

### 2.5.3.2 Suggested activities

Involving students in activities is a sure way to instill the message that ‘every drop counts’ and we all have a significant role to play in water conservation. Suggested below are activities for three different levels of education. The suggested activities have curriculum underpinnings. They, thus not only aid cognitive development but also promote development of life skills like creative thinking, critical thinking and decision making etc. which are crucial 21st century skills.

#### Exemplar 1: Water Audits

**Table 2.3 Activity for Secondary and Senior Secondary Students (Classes IX-XII)**

What is Water Audit?	Water audit is a procedure to find out how water efficient a school, home or a working space is. It involves quantitative and qualitative analysis of water consumption pattern to identify ways water is wasted, misused and helps to locate means to reduce, reuse and recycle water for improved water use.
Mode	Water audit can be done by students individually or in small groups.
Where	The water audit exercise can be undertaken at school, at their homes or any other working space be it office, cafeteria or a garden.
Purposes	<ul style="list-style-type: none"> <li>• Provide information regarding water consumption patterns</li> <li>• Explain the term ‘water efficiency’</li> <li>• Sensitize students to the importance of conserving this natural resource.</li> <li>• Create awareness regarding the ways water is wasted and misused.</li> <li>• Encourage adoption of water efficient practices so as to reduce water consumption.</li> <li>• Familiarize students with the procedures that help to reduce, reuse and recycle water and ensure their adoption at various places.</li> </ul>
Note for the Teacher	<p>Water audit is an extensive and elaborate process which involves detailed analysis of water consumption patterns for different activities at home/school or any other space and at different hours, days of the month/ and seasons. This can be attempted by students working in groups and support can be provided by the school administration.</p> <p>However, as the purpose is to orient students to the usage patterns and motivate them to adopt ways of water conservation, the exercise can also be done by individual students at a small scale by using approximation techniques.</p>
Credit	SEWA
Curriculum Linkages	<p>Mathematics- Calculation of water usage</p> <p>Science- 5 Rs (Refuse, Reduce, Reuse, Repurpose and Recycle); Water conservation</p> <p>Biology- Plant species that require less/more water; water saving practices in agriculture/ horticulture</p> <p>Research and data handling skills: data collection- like water meter readings; survey, collating data, presenting data as graphs/ tables etc.; mapping water fixtures/ toilets/ urinals etc.</p> <p>Languages: Writing newsletter, blogs, press release, poems etc.</p>

Procedure																															
<p><b>Step I</b></p> <p>Find out the Water Use / Consumption Patterns</p>	<ul style="list-style-type: none"> <li>Here student(s) are expected to list various activities in the school premises that involve consumption of water viz. drinking, toilets (flushing, personal cleaning), canteen (cooking and washing); cleaning (floors and other areas- urinals etc.); gardening and landscaping; laboratories; school vehicles cleaning, laundry, swimming pool, cooling tower etc.</li> <li>The ideal would be to calculate the quantity of water consumption for each activity.</li> <li>Students can also approximate usage by estimating the inflow/outflow of water in storage tanks per day.</li> <li>As this would be time consuming, students can be encouraged to calculate total water use at school/home by analyzing water bills, using motor method or by monitoring overhead tanks.</li> <li>They can be asked to estimate for different sectors based on personal observations.</li> <li>Analysis of water bills can be done to note change in consumption pattern during different seasons.</li> </ul>																														
<p><b>Step II</b></p> <p>Survey of Water Facilities</p>	<ul style="list-style-type: none"> <li>Student(s) can be taken to visit various spaces where water is used and make a list of number of water outlet devices, their location and make a special note of leaking/dripping taps and pipes, running cisterns or any other water misuse/wastage.</li> <li>They can tabulate the data in a table designed as per convenience of the school.</li> <li>One suggested format is below.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sl. No.</th> <th>Water Device</th> <th>No. of Devices</th> <th>Location</th> <th>Leaking or Broken</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Taps</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Toilets</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Showers</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Pipes/House</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>-----</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sl. No.	Water Device	No. of Devices	Location	Leaking or Broken	1	Taps				2	Toilets				3	Showers				4	Pipes/House				5	-----			
Sl. No.	Water Device	No. of Devices	Location	Leaking or Broken																											
1	Taps																														
2	Toilets																														
3	Showers																														
4	Pipes/House																														
5	-----																														
<p><b>Step III</b></p> <p>Analysing Data, Reporting and Taking Action</p>	<ul style="list-style-type: none"> <li>The students can report their findings as a project report to Teachers/School Manager/Principal and to concerned Eco-Club In-charge/Water Management Committee so that wastage can be taken care of.</li> <li>It is suggested that a standard procedure may be devised that involves reporting to staff, time of repair etc. Students should be encouraged to monitor and ensure that repairs and replacements are done speedily.</li> <li>Based on personal observation of appliances and individual practices, students should suggest solutions/work out a plan of follow up actions. They can be asked to create awareness, prepare education materials like charts, pamphlets, posters etc. and take up follow up actions at an individual or group level.</li> </ul>																														

SECTION I

SECTION II

SECTION III

<p><b>Step IV</b></p> <p>Monitoring Existing Water Conservation Practices</p>	<ul style="list-style-type: none"> <li>Students should survey water conservation practices that are operational.</li> <li>This understanding would help them to incorporate practices in their homes and other working areas.</li> <li>Suggested below is a list of most commonly used desirable <i>Water Conservation Practices</i>. Schools have the freedom to include more practices and students can be asked to check for their presence and make personal comments about their extent and efficacy. The non-compliance of these 'easy to do common practices' would also be a reminder to school authorities for their early corrective measures.</li> </ul>																																																							
	<table border="1"> <thead> <tr> <th>S. No.</th> <th>Practice</th> <th>Yes</th> <th>No</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Rain water harvesting</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Storage tanks</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Tanks with float valves</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Dual flush system in toilets</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Aerators or water flow restrictors on taps/taps with automatic sensors</td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>Spill proof drinking taps to check overflow</td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>Cultivating drought prone/ local plants that require little water.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>Use drip irrigation system for gardening</td> <td></td> <td></td> <td></td> </tr> <tr> <td>9</td> <td>Waste water use and treatment</td> <td></td> <td></td> <td></td> </tr> <tr> <td>10</td> <td>Ground water recharge structure</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	S. No.	Practice	Yes	No	Comments	1	Rain water harvesting				2	Storage tanks				3	Tanks with float valves				4	Dual flush system in toilets				5	Aerators or water flow restrictors on taps/taps with automatic sensors				6	Spill proof drinking taps to check overflow				7	Cultivating drought prone/ local plants that require little water.				8	Use drip irrigation system for gardening				9	Waste water use and treatment				10	Ground water recharge structure			
	S. No.	Practice	Yes	No	Comments																																																			
	1	Rain water harvesting																																																						
	2	Storage tanks																																																						
	3	Tanks with float valves																																																						
	4	Dual flush system in toilets																																																						
	5	Aerators or water flow restrictors on taps/taps with automatic sensors																																																						
	6	Spill proof drinking taps to check overflow																																																						
	7	Cultivating drought prone/ local plants that require little water.																																																						
	8	Use drip irrigation system for gardening																																																						
9	Waste water use and treatment																																																							
10	Ground water recharge structure																																																							

### Exemplar 2: Let's be Water Wise!

**Table 2.4 Activity for Middle School Students (Classes VI-VIII)**

Let's be Water Wise!	This activity will make students realize the importance of water for life. Generally, if something is easily or abundantly available to us, it is taken for granted. This particular activity will help them realize the importance of water in day-to-day life and need for its conservation.
Mode	Activity can be done in class as group activity.
Where	The exercise can be undertaken at school.
Purposes	<ul style="list-style-type: none"> <li>Sensitize students to the importance of water and its efficient use.</li> <li>Create awareness regarding the amount of water wastage happening due to negligence.</li> <li>Encourage adoption of water efficient practices so as to reduce water consumption.</li> </ul>
Note for the Teacher	Since the primary classes' students are young and imaginative, their imagination skills must be used to explain the importance of water in their lives. Basic mathematical calculations can be done to make them realize how much water they waste unknowingly and how it is affecting us today and in the near future.



Credit	Internal assessment in Environmental Studies/ Mathematics
Curriculum Linkages	<p>Mathematics – Calculation of water wastage</p> <p>Environmental Studies – Importance of water</p> <p>Languages – Writing slogans/ messages for Water Conservation etc.</p> <p>Art – Make poster on Water Conservation</p>
<b>Procedure</b>	
<p><b>Step I</b></p> <p>Imagine if there is no water</p>	<p>Let the students imagine that –</p> <ul style="list-style-type: none"> <li>• They are in a playground on a sunny day during summer holidays. They are very thirsty and the water bottle is empty. There is no water source near them and their friends are also out of water. What would they do?</li> <li>• They get up in the morning and get to know that there will be no water for the next two days. What will they do?</li> <li>• They urgently want to go to the toilet and there is no water. What will they do?</li> <li>• Think of all the activities which they cannot do without water.</li> </ul>
<p><b>Step II</b></p> <p>Critical Thinking</p>	<ul style="list-style-type: none"> <li>• Identify a tap in the school which is dripping. Keep a container underneath this dripping tap. Let it stay for an hour. Now calculate how much water is there in the container. This is the approximate amount of water wasted in one hour.</li> <li>• In the Mathematics class, ask them to calculate how much water will be wasted by a dripping tap in a day/ week/ month/ year using the approximation calculated above.</li> <li>• Ask them to carry out a survey and calculate the number of taps in their school.</li> <li>• Let them calculate the water wastage if all the taps in the school are left partially open by students in the washrooms. Discuss how carelessness contributes towards water wastage.</li> </ul>
<p><b>Step III</b></p> <p>Creative Thinking</p>	<ul style="list-style-type: none"> <li>• Ask them to do a role play on water by enacting the role of water and showing the emotions it might go through because of the way we humans treat it.</li> <li>• Ask them to write slogans/ poem to conserve water in day to day life.</li> <li>• Ask them to design a poster on Water Conservation and display in their classroom.</li> <li>• Ask them to make a short play and enact in class to demonstrate the ways they can conserve water in school and at home.</li> <li>• Ask them to make their parents and neighbors aware about what they have learnt in class and share at least 5 tips to save water at home.</li> </ul>

*The students will become wise about their water habits. They will start using water efficiently and create awareness among others.*

**Exemplar 3: Activity for Primary Students (Classes III-V)**

Water-Our Precious Lifeline	This activity will make students realise the significance of water as a limited resource. They will recognise the common areas of water wastage and adapt a cautious approach.
Mode	Activity can be done in class and at home.
Purposes	<ul style="list-style-type: none"> <li>Sensitize students to the issue of water conservation.</li> <li>Encourage students to change their habits in order to avoid wastage of water.</li> </ul>
Credit	Internal assessment in Mathematics and Language
Curriculum Linkages	Languages Mathematics
<b>Procedure</b>	
As indicated in the accompanying box	

SAVING ONE LITRE EVERY DAY

# WATER- OUR PRECIOUS LIFELINE

SIMPLE STEPS WITH HUGE IMPACT



**CONSERVE WATER.**  
NOT USING IT? TURN IT OFF!

**THE LEAKAGE MATHS!**  
LESS WASTAGE, MORE SAVINGS

A leaking tap drips 1 drop of water every 10 seconds. One drop is about one tenth of a millilitre. Calculate how much water wastage will happen if this tap goes unnoticed and continues to drip for 2 months.



### MY STORY

THE STUDENTS WOULD WRITE A SHORT STORY USING AT LEAST 7 OF THE FOLLOWING WORDS

Grey Water, Planet, Reservoir, Flora, Butterflies, Trees, Clean, Sky, Reuse, Bathe, Nature, Society, Rainfall



**REACH OUT AND MAKE A  
DIFFERENCE**  
REPORT LEAKAGES



Students will learn to write letters to the concerned authority to bring to light instances of water leakages.



### SAVE WATER, SAVE LIFE

Take shorter showers/baths  
Turn the water off, while you brush your teeth  
Turn off water while applying soap or shampoo  
Use a container to wash your paint brushes.

Did you Know?

Two third of your body is made of water.  
500 sheets of paper requires 5,000 litres of water.



SOURCE:  
[HTTP://ENVIRONMENT.NATIONALGEOGRAPHIC.COM/ENVIRONMENT/FRESHWATER/EMBEDDEDWATER/](http://environment.nationalgeographic.com/environment/freshwater/embeddedwater/)

**Exemplar 4: Water is Life!****Table 2.5 Activity for Primary Students (Classes I - III)**

Water is Essential for Life!	This activity will make students aware that water is important for existence. Water is used in various ways and people in different occupations use water for various purposes. This activity will help students recognize the presence of water around us and its importance.
Mode	Activity can be done in class as a group activity.
Where	The exercise can be undertaken in the classroom.
Purposes	<ul style="list-style-type: none"> <li>• Make students realize that water is essential for life.</li> <li>• Make students aware that people need water for various activities.</li> <li>• Make students understand that they need regular water supply to survive.</li> </ul>
Note for the Teacher	The teacher should make an effort to make students see that all of us use water in various ways and it is difficult to survive without water. The use of water in different occupations is a rich resource to strengthen the Environmental Studies content.
Credit	Internal assessment in Environmental Studies/ Language
Curriculum Linkages	Environmental Studies – Importance of water, Languages – Writing about their favorite water activity. Art – Creating visuals of their favorite water activity.
<b>Procedure</b>	
<b>Step I</b> Personal Activities where they use water	<ul style="list-style-type: none"> <li>• The students would be asked to list activities for which they need water.</li> <li>• After they have listed these activities, the teacher can lead discussion by asking a question- Would they be able to survive without water?</li> <li>• The discussion can also be related to the source of water supply in their homes and its timings. In this context, the scarcity of water and the ways in which water is wasted during personal use would be highlighted.</li> </ul>
<b>Step II</b> List of Different Occupations	<ul style="list-style-type: none"> <li>• The students would be provided a list of occupations like farmer, doctor, cook, potter, fishermen, firefighter and barber and asked in what ways they all use water.</li> <li>• Subsequent discussion can then relate various uses of water.</li> </ul>
<b>Step III</b> Creativity	<ul style="list-style-type: none"> <li>• The students can then be asked to write about their favorite water activity and draw a picture of activities.</li> <li>• With reference to each activity like painting, the teacher can inform them to wash paint brushes in a bowl rather than wash them under a running tap; or gardening, the teacher can tell them to use watering cans instead of using water pipes.</li> </ul>
<i>The students will become conscious of practices where they waste water and develop the right habits.</i>	

## B. Other Suggested Activities

Suggested below are some ways through which the students can be made aware and motivated to conserve water. Suggested list offers few possibilities. Teachers have the liberty to add, modify and substitute activities which they consider best to achieve the desired results.

**Table 2.6 Other Suggested Activities**

<b>Committing to the cause</b>	Students can be asked to take a pledge to adopt water saving practices at home and school. They can also motivate any 5 people around them to take water pledge.
<b>Creating Awareness</b>	Students can be asked to post notices about water conservation next to bathrooms, classrooms, laboratories and kitchen sinks. These notices can be important tips for water conservation or details of person to be contacted at times of leaks.
<b>Developing IEC (Information, Education and Communication) material</b>	Create water conservation poster, stickers or signs for display at home and school. Wall paintings and water comics may also be created and posted with due permission from school authority to create awareness on water conservation.
<b>Literary Activities with a focus on Conserving Water</b>	Write poems, scripts of skits on water conservation, story, play or video script about water. They can also write small songs or jingles which can be sung to communicate messages on water conservation. Design a bulletin board in the school stating importance of water, interesting facts, Jal Shakti Abhiyaan and tips on water conservation.
<b>Simple Maths to be Water Wise</b>	Calculate water consumption per activity – drinking, brushing, personal cleaning, toilet flushing, washing clothes, cooking, washing fruits or vegetables, cleaning utensils, mopping floors, gardening, car wash, play, swimming etc.
<b>Let's talk about water</b>	Do a presentation on water conservation Prepare and perform a street play in school and neighbourhood communities to conserve water.
<b>Field Visits/Trips</b>	Field trips/ visits can be organized to show rainwater harvesting structures, wetlands, drinking water supply plants, sewage water plants, watershed management units etc.

**Schools can award 1 child per class every month who proposes and practices innovative measures to conserve water in the school as well as homes and can other outside activities.**

## 2.6 Reach out to the Community

Making water conservation a personal habit is as important as reaching out to others in the community. Students at an individual level can be encouraged to share this information with people around; neighbors, friends, relatives in various locations like parks, gyms, cafeterias etc. Encouraging community to conserve water is a big task. Initiating discourse and creating awareness among the public at large are the initial crucial steps for this endeavour.

Use water wisely: Personal Tips	Helpful suggestions to conserve water at home
<ul style="list-style-type: none"> <li>• If not using a water source/tap, turn it off.</li> <li>• Turn the water off, while you brush your teeth or wash dishes.</li> <li>• Take shorter showers/baths</li> <li>• Prefer to use a bucket instead of shower for baths</li> <li>• Turn off water while applying soap or shampoo</li> <li>• Use a container to wash your paint brushes</li> <li>• Report leaking taps, toilets and get someone to fix them quickly.</li> </ul>	<p><b>Tips for the Kitchen:</b></p> <ul style="list-style-type: none"> <li>• Use a bowl of water to clean vegetables and fruits</li> <li>• Use an appropriate pan size</li> <li>• Use a pressure cooker when cooking food in a pot, cover with a tight fitting lid</li> <li>• Avoid overcooking and water loss by timing the cooking process</li> <li>• Run the dishwasher with full load</li> </ul> <p><b>Tips for Gardening:</b></p> <ul style="list-style-type: none"> <li>• Water during the cool parts of the day</li> <li>• Use drip irrigation sprinklers</li> </ul> <p><b>Tips for Outdoors:</b></p> <ul style="list-style-type: none"> <li>• Use a broom to clean driveways, steps, sidewalks etc.</li> <li>• Don't run the hose while washing the car, instead use a bucket</li> </ul>

The school as an institution can also engage with community in various ways viz.

- Conduct a water fair **नीरोत्सव** to educate one another and the community about water conservation as part of school hub activities. Schools here would project their practices, demonstrate innovative projects and solutions, organize quizzes, skits and other competitions.
- Partnership with NGOs on water conservation.
- School or class project to protect local water bodies for example restoring Yamuna

**CBSE proposes to honour schools who are water efficient and adopt best Water Conservation practices with 'Green Awards' (NEERSHAKTI PURASKAR)**



# SECTION III

## **Suggested Eco-Club Activities**





# कभी मेरी भी सुनो!

सब केवल कहते हैं, सुनता कोई नहीं....

मुझसे माँग लेते हैं मेरा, देता कोई नहीं

धरोहर जो लेकर पली थी, रिक्त हो चली,

मेरे यौवन की रोशनी उम्र से पहले ही ढली,

रूको, कुछ कहना है मुझे-

तुम मेरे कर्णधार बनो।

कभी मेरी भी सुनो!

यहाँ जिसमें भी रंग है, या जो बेरंग भी हैं-

मेरा वजूद है उसमें, कहीं न कहीं।

नहीं चाहती कि करो आराधना मेरी हरपल,

पर दिल से सराहो तो कभी-कभी।

सहती हूँ, कि सहना है मुझे-

तुम मेरे तारणहार बनो।

कभी मेरी भी सुनो!

कलेवर में समेटे मूकों का समस्त संसार-

सृष्टि के अस्तित्व का मूल आधार।

सोचती हूँ, क्यों मिट रही हूँ मैं?

प्रतिदिन अपने कद से क्यों घट रही हूँ मैं

यहीं, आपके बीच रहना है मुझे

मेरी खुशियों का संसार बनो

कभी मेरी भी सुनो!

ममता रजनीश

# Lend me thy ears

My pleas fall on deaf ears  
As everyone snatches what once belonged to me.  
The legacy I grew up with is being decimated.  
The glory of my youth is waning before the tide of time.  
Stop! I call out. Hear me at least!  
For thou are my saviour  
Lend me your ears.  
For all that is picturesque and all that is barren today  
Carries in it my soul, my identity  
I do not wish to be idolised.  
But yes, praised once a while.  
I suffer for that is my destiny  
But you can rise to be my benefactor .  
Oh for once lend me your ears.  
I carry within me this world full of insensitive beings.  
Who are the very foundation of the pyramid of life.  
I often wonder why I am crumbling like this?  
Every day dilapidating from my former self.  
All I want is to co exist with you  
I need you to become my world of happiness.  
For once, lend me your ears.

Translated by

**Ms. Shivani Mehta**

### 3.1 Suggested Activities: Primary Level (Classes I-V)

Table 3.7 PRIMARY LEVEL

S. No.	Theme	Activity	Outcomes The learners ...	Curriculum Linkages
1	Waste Management	<b>Segregation of Waste</b>	<ul style="list-style-type: none"> <li>Distinguish between wet/dry or biodegradable/non-biodegradable waste</li> <li>Adopt the practice of sustainable consumption</li> </ul>	Environmental Studies
2	Biodiversity Conservation	<b>Becoming a Wildlife Explorer</b>	<ul style="list-style-type: none"> <li>Observe and record names of flora and fauna existing in the school campus</li> <li>Identify the life processes that are common to both plants and animals</li> <li>Infer that a particular habitat supports a particular species of plants/animals</li> <li>Generate a Species Inventory at the school level</li> </ul>	Environmental Studies
3	Air Pollution	<b>My Scrapbook</b>	<ul style="list-style-type: none"> <li>Scan newspapers for relevant information</li> <li>Collate information from different sources</li> <li>Design and develop a scrapbook</li> <li>Become aware of the magnitude of air pollution</li> <li>Develop a habit of reading newspaper</li> <li>Observe healthy practices that do not contribute to air pollution</li> </ul>	Environmental Studies, Art, Language
4	Reduce, Refuse, Reuse, Repurpose, Recycle	<b>The Waste Free Tiffin Day</b>	<ul style="list-style-type: none"> <li>Make students aware about the impacts of their lifestyle and choices on the environment</li> <li>Motivate students to make sustainable and healthy food choices</li> </ul>	Social Science

SECTION I

SECTION II

SECTION III

### 3.1.1. Activity 1 – Segregation of Waste

**Curriculum Linkages:** Environmental Studies

**Goal:** Waste segregation helps to reduce the amount of waste that goes to a landfill. It not only makes waste disposal cheaper but is also important for protection of human health and environment. This activity would create an understanding about dry and wet waste.

**Outcomes:** The learners would . . .

- distinguish between wet/dry or biodegradable/non-biodegradable waste
- adopt the practice of sustainable consumption

**Duration:** 30 minutes

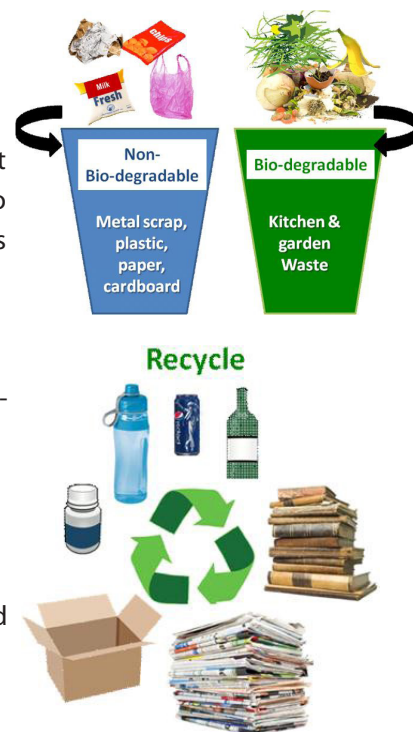
**Materials Required:** Picture cards; different types of wastes; and cardboard boxes (3) - labeled – mixed, dry and wet waste

#### Methodology:

1. Ask students to bring any one type of waste to classroom.
2. Place a common cardboard bin in one corner of the classroom. Ask all students to put the waste they have brought to class in the common bin.
3. Now, the students with guidance from teacher, segregate waste in two separate bins – Blue bin (non-biodegradable waste like plastic wrappers, aluminum foil, plastic coated paper cups/plates, metal cans, plastic bottles etc.) and Green bin (bio-degradable waste like peels of fruits or vegetables, left-over food, garden waste etc.).
4. Biodegradable waste can be composted and majority of non-biodegradable non-toxic waste can be recycled. Thus, waste segregation helps in reducing pressure on our landfills where most of the waste is dumped.
5. Teacher may use picture cards to explain time requirement for decomposition of different types of wastes. [Information for Picture cards. Time required to decompose various types of waste - Plastic bottles: 70-450 years, Plastic bag: 500-1000 years, Tin can: around 50 years, Glass bottle; 1-2 million years, Aluminum can: 200 years, Leather shoes: 25-40 years, Thread: 3-4 months, Cotton: 1-5 months, Milk packet (tetra) covers and drink packets: 5 years, Nylon clothes: 30-40 years, Children's' diapers: 500-800 years].

#### Resources:

- <https://www.down2earthmaterials.ie/2013/02/14/decompose/>. (Information on time required to decompose various types of waste). accessed on 03.07.2019
- <http://www.greenschoolsprogramme.org/knowledge-bank/waste/>. (website on Understating waste). accessed on 03.07.2019



### 3.1.2. Activity 2 – Becoming a Wildlife Explorer

**Curriculum Linkages:** Environmental Studies- Biodiversity Conservation

**Goal:** This activity serves as a primer for the Eco-Club members. It familiarizes them to the plant and animal wealth around.

**Outcomes:** The learners would...

- observe and record names of flora and fauna existing in the school campus
- identify the life processes that are common to both plants and animals
- infer that a particular habitat supports a particular species of plant/animal.
- prepare a Species Inventory at the school level with the support of the teacher

**Duration:** 30 minutes

**Materials Required:** Writing sheets, pen, and pencil

#### Methodology-

1. It is important to comprehend the characteristic features of a living species to be able to develop futuristic plans for its conservation. Creating school inventories is the first step towards a greater goal of adopting a naturalistic approach in life.
2. Both plants (flora) and animals (fauna) are living organisms, yet there are several differences between these. If observed carefully, there are also similarities between the two. Both need nutrition to grow and conduct life processes; they use food, give off wastes, and reproduce. On the other side, most plants can make their own food, but animals cannot. A green pigment called chlorophyll helps plants to make their food. Movement is a specialized feature in animals.
3. After discussing the basic differences between plants and animals, students should be asked to list the names of at least 5 species of plants and 5 species of animals and make unique lists (applicable to the location of their school). These lists should then be compiled with the help of coordinator into a master list.
4. Ask the learners to observe and identify characteristic features of plants and animals. For identification of plants, plant identification apps may be used if the species is unknown.
5. This list should be developed as a new activity every year, since it will also help in assessing the changes that take place with species constitution at a micro level.
6. Students should develop factsheets about some unique species and maintain a record in the Eco-Club diary.

#### Resources:

- <https://sciencing.com/characteristics-plants-animals-5491852.html>. Last accessed 30.6.2019
- <https://biodifferences.com/difference-between-plants-and-animals.html>. Last accessed 30.6.2019

### 3.1.3. Activity 3 – My Scrapbook

**Curriculum Linkages:** Environmental Studies, Art, Language

**Goal:** To sensitize students about air pollution and introduce them to the habit of newspaper reading, the learners are asked to make a scrapbook.

**Outcomes:** The learners would . . .

- scan newspapers for relevant information
- collate information from different sources
- design and develop a scrapbook
- become aware of the magnitude of air pollution
- develop a habit of reading newspaper
- observe healthy practices that do not contribute to air pollution

**Duration:** An ongoing activity over a period of one or two months.

**Materials Required:** Notebooks and newspapers

#### Methodology:

1. Ask students to start a scrapbook on air pollution by collecting local newspaper clippings and articles
2. They could arrange clippings under separate headings /focus area. Each report should be pasted neatly under different sections of the workbook.
3. Students to neatly write the name of the newspaper, date and year of the report.
4. The scrapbook can include photographs, captions, illustrations etc. Students can also draw and illustrate themselves.
5. The scrapbook should be neatly covered and labeled.
6. Give one month's time to students to prepare the scrapbook. Later they can exchange scrapbooks with other students to see each other's work.
7. Preferred time to conduct this activity can be during peak winter or Diwali time.

#### Discussion:

1. Organize weekly discussions on newspaper reports.

2. Discuss the ill-effects of air pollution on health and the diseases, which are on rise due to pollution
3. Ask students for solutions to this growing menace.

### Resource:

Joy of Learning: A publication developed by CEE and Vikram A. Sarabhai Community Science Centre in collaboration with VIKSAT and Darpana Academy of Performing Arts for NCERT for Standards 6 to 8

### 3.1.4. Activity 4 – Waste Free Tiffin boxes

**Curriculum Linkages:** Social Science

**Goal:** The students would analyse and link the 5 R's (Reduce, Refuse, Reuse, Repurpose and Recycle) to their lifestyle. The activity would encourage students to adopt better habits keeping the environment in consideration.

**Outcomes:** The learners would...

- be aware about the impact of their lifestyle and choices on the environment.
- be motivated to make sustainable and healthy food choices.

**Duration:** 30 minutes for a week

**Materials Required:** A discussion room, students' lunch boxes for demonstration purpose

### Methodology:

1. This activity should be conducted regularly over a week so that changes can be noticed and recorded.
2. On day 1, the teacher should ask all students to take out the tiffin boxes from their bags and place them on their benches.
3. Instruct the class to further deposit the lunch boxes in 2 separate sections created near an area in the front. One is labeled as 'Plastic lunch boxes', and the other is labeled 'Non-plastic lunch boxes'. Count the number of boxes in each category and write it on the black board against a date entry. Some lunch boxes may have plastic as well as steel. In case, plastic is more, it should be categorized as 'Plastic lunch box'
4. The class should be informed about the problems linked with use of plastics. They should also be informed about the available options- steel boxes, reusable cloth napkins, etc.
5. Hopefully the number of plastic boxes will reduce over a week's time. This change should be announced in the class and students be congratulated over the achievement.

6. A mid- week day, preferably 'Wednesday' should be observed as a no-waste day. On this day, the teacher should remove the dustbin from the class and no child should be allowed to throw the leftover food from their box into the bin.
7. Learners should be encouraged not to carry paper napkins but bring cloth napkins to schools. They can be taught to embroider their names on the napkins and bring these to school every day.
8. Similarly aluminum foil and plastic wraps should be discouraged.

The benefits of the above actions should be explained to the class meticulously. Both time and money are being saved in the process of doing away with throwaway wraps and flashy tiffin boxes. If the entire class is practicing this, it will soon be imbibed as a regular practice and students will feel proud of the change that it has instilled in them. The class will thus learn how *Reduce-Refuse-Reuse-Repurpose-Recycle* works in their daily lives.

*Reduce-* Only the amount of food that can be consumed should be brought. Throwing away of leftovers should be completely avoided. Avoid plastic packaging

*Reuse-* Cloth napkins reduce the culture of use and throw of paper napkins

*Recycle-* Cloth napkins should be created out of old hand towels, which are still in reusable state. These should be cleaned and washed properly before converting these to cloth napkins

*Refuse-* Only the amount which is required, may be taken

*Repurpose-* Discussions on how old tiffin boxes and napkins can be used for other purposes

### Resources:

- [https://www.creationcare.org/top\\_5\\_things\\_to\\_help\\_reduce\\_lunch\\_box\\_trash](https://www.creationcare.org/top_5_things_to_help_reduce_lunch_box_trash). Last accessed on 30.6.2019
- [https://www.huffpost.com/entry/reusable-waste-free-lunch\\_b\\_5634600](https://www.huffpost.com/entry/reusable-waste-free-lunch_b_5634600). Last accessed on 30.6.2019
- <http://wastefreelunches.org/parents.html>. Last accessed on 30.6.2019



## 3.2 Suggested Activities: Middle Level (Classes VI-VIII)

Table 3.9 MIDDLE LEVEL

S. No.	Theme	Activity	Outcomes The learners ...	Curriculum Linkages
5	Swachhta Drive	<b>Swachhta Pakhwada in Schools</b>	<ul style="list-style-type: none"> <li>Develop the spirit of 'Swachhta Hi Seva'</li> <li>Motivate others for creating a clean school and surroundings</li> </ul>	Science, Social Science, Work Experience
6	Biodiversity Conservation	<b>Building Bird Boxes</b>	<ul style="list-style-type: none"> <li>Nurture the feelings of concern for birds</li> <li>Become familiar with different types of birds and their natural nests</li> <li>Appreciate the variety of nests created by fellow learners</li> </ul>	Science, Work Experience
7	Biodiversity Conservation	<b>Creating a School Herbal Garden</b>	<ul style="list-style-type: none"> <li>Acquire skill to plant saplings</li> <li>Know the importance of herbs in health care, cuisine, traditions, and culture.</li> <li>Appreciate the medicinal value of plants</li> <li>Realize the importance and use of herbs and spices in cooking</li> </ul>	Science
8	Biodiversity	<b>My Vertical Garden</b>	<ul style="list-style-type: none"> <li>Learn the value of gardening in small areas</li> <li>Appreciate nature in its various forms</li> <li>Become familiar with local flora and fauna</li> <li>Know different gardening tools and techniques, use and practice them</li> <li>Cultivate plants in their homes and surroundings and nurture them</li> </ul>	Science, Work Experience

SECTION I

SECTION II

SECTION III

9	Appreciating Nature	<b>The Leaf Safari Day</b>	<ul style="list-style-type: none"> <li>Name and categorize plants into different families</li> <li>Appreciate the diversity in plants</li> <li>Acquire knowledge about the characteristic features of each plant family</li> <li>Classify plants on physical features of leaves</li> </ul>	Science
---	---------------------	----------------------------	--	---------

### 3.2.1. Activity 5 – Swachhta Pakhwada in Schools

**Curriculum Linkages:** Science, Social Science, Work Experience

**Goal:** To build a spirit of Swachhta hi Seva, Swachhta Pakhwada is to be organized in school.

**Outcomes:** The learners would. . .

- develop the spirit of 'Swachhta Hi Seva'
- motivate others for creating a clean school and surroundings

**Duration:** Ongoing activity-15 days; 1-15 September

**Materials Required:** As per the activities viz. colours, chart papers etc.

#### Methodology:

The following activities may be carried out in 15 days as per schools convenience:

Day 1	<ul style="list-style-type: none"> <li>Special assembly to recognize the importance of cleanliness.</li> <li>Taking of pledge</li> <li>Display messages and banners made by students on 'Swachhta Pakhwada' in school</li> </ul>
Day 2	<ul style="list-style-type: none"> <li>Announcement of activities to be conducted under Swachhta Pakhwada in school</li> <li>Personal Hygiene Day - Personal hygiene inspection of students in each class by class representatives</li> </ul>
Day 3	<ul style="list-style-type: none"> <li>School Cleanliness Drive - Divide students in teams and conduct cleanliness drive within school premise with the support of school staff</li> </ul>
Day 4	<p>School Cleanliness Drive</p> <ul style="list-style-type: none"> <li>Creating list of all kinds of waste material like old file, furniture unusable equipment.</li> <li>Competent authority to help to discard waste materials</li> </ul>

Day 5	<p>Swachh Water Day</p> <ul style="list-style-type: none"> <li>• Audit water storages, leaks</li> <li>• Inform competent authorities regarding same</li> <li>• Create awareness about water borne diseases</li> </ul>
Day 6	<p>Green School Drive</p> <ul style="list-style-type: none"> <li>• Set up No-Plastic zones</li> <li>• Set-up waste segregation in canteen</li> </ul>
Day 7	<p>Green School Drive</p> <ul style="list-style-type: none"> <li>• Cleanliness drive in school park</li> <li>• Plantation drive</li> </ul>
Day 8	<p>Swachhta Competition Day</p> <ul style="list-style-type: none"> <li>• Debate</li> <li>• Essay writing</li> <li>• Painting</li> <li>• Best out of waste</li> <li>• Quiz</li> <li>• Comic story writing</li> </ul>
Day 9	<p>Community Participation Day</p> <ul style="list-style-type: none"> <li>• Swachhta rally and street play in neighborhood</li> </ul>
Day 10	<ul style="list-style-type: none"> <li>• PTA meeting to highlight the importance of cleanliness.</li> <li>• Exhibition of initiatives undertaken by students</li> </ul>

SECTION I

SECTION II

### Resources:

- [http://cbseacademic.nic.in/web\\_material/Circulars/2018/22\\_Circular\\_2018.pdf](http://cbseacademic.nic.in/web_material/Circulars/2018/22_Circular_2018.pdf) (suggestive activities for swachhta pakhwada in schools), accessed on 03.07.2019
- <https://swachhbharat.mygov.in/basic-page/take-pledge> (Swachhta pledge), accessed on 03.07.2019

### 3.2.2. Activity 6 – Bird Box Building

**Curriculum Linkages:** Science, Work Experience

**Goal:** Birds are important part of our ecosystem as they help in dispersion of pollens and seeds. They are part of many food-webs and thus, there is a need to create safe habitat for bird. With urbanization, the land use pattern of the cities is changing resulting in loss of habitat of bird. Their exposure to new predators, air pollution, noise, limited food sources, material for nesting etc. is causing a decline in some bird species.



**Bird nest**

Source: <https://manualidadesparahacerencasa.com/originales-trabajos-reciclados-con-botellas-de-2-bebidas/>

SECTION III

**Outcomes:** The learners would. . .

- nurture the feelings of concern for birds
- become familiar with different types of birds and their natural nests
- appreciate the variety of nests created by fellow learners

**Duration:** 30 minutes for nest making; ongoing activity – 1 year – observation, establishment and maintenance of bird nests in 3 locales – home, school and neighborhood park.

**Materials Required:** 2 liter cold drink pet bottles, acrylic colors, brushes to paint, jute rope, scissors, nest bed material (dry grass, twigs, moss, dry leaves, cotton balls etc.), marker, and glue/ fevicol

### Methodology:

1. Cut the 2 litre pet bottle in two halves each.
2. Draw a big oval shape window (of size which allows a bird to enter) on the bottom part of the bottle and cut it out.
3. Make a design in the upper portion of the bottle as shown in the figure.
4. Paint both portions in contrasting colors and let them dry.
5. Now, to make the nest more attractive, decorate both portions of the bottle, highlighting all outlines of the nest.
6. Make a hole in the cap of the bottle. Pass the jute rope through it and knot it from inside.
7. Create a bed inside the bottom portion of the nest using dry grass, twigs, moss, dry leaves, cotton balls etc.
8. Now, place the two cut outs of the bottles on each other and paste them.
9. The students may place the nest at any place where they can regularly observe it – balcony at home, garden, community park or the school garden. They can observe birds living in nests created by them.
10. The students may also create bird feeders along with it – one for water (<https://www.youtube.com/watch?v=q6EitavSRNg>) and one for food ([https://www.youtube.com/watch?v=ur\\_Lt5WgRs0](https://www.youtube.com/watch?v=ur_Lt5WgRs0)). They can observe various birds visiting the feeder for food and water.

### Resources:

- <https://www.youtube.com/watch?v=a1MfrKRdTE8> (YouTube demonstration video of how to make nest from PET bottle) accessed on 03.07.2019
- Ali, S. (2003). The book of Indian birds. The Bombay Natural History Society; Bombay. (book on birds of India, help identifying different species) accessed on 03.07.2019
- <http://www.prbo.org/cms/docs/edu/activity4.pdf> (types of bird nests) accessed on 03.07.2019

- <https://in.pinterest.com/pin/482096335089950667/> (photo of nest created from refined oil plastic can) accessed on 03.07.2019
- <https://in.pinterest.com/pin/576742296011685061/> (photo of nest created from jute rope and twigs) accessed on 03.07.2019
- <https://www.deepjunglehome.in/making-bird-houses-with-unused-material-at-home/> (photo of innovative nest created from waste material) accessed on 03.07.2019
- <https://homesthetics.net/diy-bird-feeder/> (photo of innovative bird feeds created from waste material) accessed on 03.07.2019
- <https://www.nationaltrust.org.uk/features/how-to-make-your-own-bird-box> (website with detailed information on planning the garden) accessed on 03.07.2019

### 3.2.3. Activity 7 – Creating a School Herbal Garden

**Subject Linkages:** Science- Indigenous Knowledge

**Goal:** The activity seeks to apprise learners about the medicinal values of the indigenous plant species and familiarize them with the age old traditions associated with them.

**Outcomes:** The learners would...

- acquire skill to plant saplings
- know the importance of herbs in health care, cuisine, traditions, and culture.
- appreciate the medicinal value of plants
- realize the importance and use of herbs and spices in cooking



**Duration:** Ongoing activity over a period of 1 month

**Materials Required:** Garden tools, plant saplings, cardboard tags, pens

#### Methodology:

1. Choose a site for the herbal garden within the school premise.
2. With the garden tools, let the learners dig over the soil and make flower beds
3. Arrange for the saplings from the nursery, and let the learners plant them adding identification tags and water them regularly.
4. The learners can do some research on the medicinal values of each herb in their garden, know its uses and other values, conservation status, and traditional use.

5. As an assignment, learners can further research on the culinary use of herbs, and their medicinal properties. They can share a recipe focusing on a particular herb and describing the method of preparation, highlighting the herb's many values.

### Additional Resources:

- <https://www.fix.com/blog/start-a-garden-at-your-school/>
- <https://learningherbs.com/skills/herb-gardening-with-kids/>

### 3.2.4. Activity 8 – My Vertical Garden

**Curriculum Linkages:** Science, Work Experience

**Goal:** Create a vertical garden in school and teaching students the skill of gardening. The activity will also inform students about the diverse types of plants.

**Outcomes:** The learners would . . .

- learn the value of gardening in small areas
- appreciate nature in its various forms
- become familiar with local flora and fauna
- know about different gardening tools and techniques and practice using them
- cultivate plants in their homes and surroundings and nurture them.

**Duration:** 60 minutes; ongoing

**Materials required:** Old plastic containers, hooks and rope to hang the plants, decorative material to decorate the pot, soil, sapling, manure.

### Methodology:

1. Ask the students to bring old plastic containers from home and decorate them as a work experience project/activity.
2. Make 2 holes of about 1cm each below the rim on the two sides of each container to tie the rope and a hook to hang the pot on the wall. Hammer your hooks into the wall.
3. Add some small drainage holes in the base of the containers. Add soil and manure in the pot till about 2 cm below the rim.
4. Let the students sow seeds/ a sapling brought from home.
5. Hang the pots, water the plants regularly and let the students observe their plants grow each day.

**Discussion:**

1. What types of plants were used for this activity?
2. Ask students to find out the kind of birds, butterflies, insects etc. that feed on these plants and flowers.
3. Was the manure organic? If no, give reasons
4. Ask students to write an essay (about 200 words) on 'their experience of creating a vertical garden.'

**Resource:**

- <https://www.kidspot.com.au/things-to-do/activity-articles/vertical-garden/news-story/ddef7e4900c6063395db575e9dba30a0>

**3.2.5. Activity 9 – The Leaf Safari Day**

**Curriculum Linkages:** Science- Appreciating Nature

**Goal:** The learners explore their surroundings to learn about different types of leaves.

**Outcomes:** The learners would...

- name and categorize plants into different families.
- appreciate the diversity in plants
- acquire knowledge about the characteristic features of each plant family.
- classify plants on physical features of leaves

**Duration:** 30 minutes

**Materials Required** -Tracing paper, newspaper, marking pen or crayon

**Methodology:**

1. Leaves of plants come in all shapes and sizes. Some leaves have smooth edges; others have edges that are serrated, with little 'teeth' all around them; some leaves are long and thin; others are rounded, or shaped like a person's hand; still others are compound leaves, made of several leaflets. The leaves of most evergreens are made of clusters of needles. The learner can discuss these shapes and study the diagrams from books available in the school library. They can also access online resources to acquire a basic understanding of types of leaves. Illustrations and diagrams are most convenient to get a quick overview.

2. Once the students build a basic understanding of the diverse types of leaves, ask them to move around the school campus and pick up fallen leaves. Advise the learners to not pluck fresh leaves.
3. Help the student record these names in their Eco-Club diary.
4. To preserve the leaves for mounting, carefully place each leaf between two pieces of tracing paper. Now place the leaf and the tracing paper between several sheets of newspaper. Leave these to dry and place them under weight (learners can place these under heavy book piles).
5. Change the newspaper after every 4-5 days till the leaves are completely dry.
6. Now paste these leaves on a thick drawing sheet, and write the names of the parent plants and family below each leaf. They can also record the location from where they have collected the leaf through a GPS setter. In case, they are not able to identify plant, plant identification apps such as Plantnet can be used.
7. After pasting all the leaves, group the ones which fall under same plant family. Now study these carefully. The students will observe and infer that the shapes of leaves under one family are similar.

**Resources:**

- [http://www.wildflowers-and-weeds.com/Plant\\_Identification/Patterns\\_in\\_Plants.htm](http://www.wildflowers-and-weeds.com/Plant_Identification/Patterns_in_Plants.htm). Last accessed on 30.6.2019
- [http://www.hopspress.com/Books/Botany\\_in\\_a\\_Day.htm](http://www.hopspress.com/Books/Botany_in_a_Day.htm). Last accessed on 29.6.2019
- <https://www.bigbend.edu/academics/programs/botany/plant-classification/>. Last accessed on 29.6.2019



### 3.3 Suggested Activities: Secondary Level (Classes IX-X)

Table 3.8 SECONDARY LEVEL

S. No.	Theme	Activity	Outcomes The learners ...	Curriculum Linkages
10	Biodiversity Conservation	<b>Our Butterfly Garden</b>	<ul style="list-style-type: none"> <li>Gather data on habitat requirements of butterflies from available literature</li> <li>Identify host and nectar indigenous plants for the butterflies</li> <li>Explain the life cycle of butterflies</li> <li>Sharpen their observation to report phenomenon objectively and draw conclusions</li> </ul>	Science
11	Biodiversity	<b>Visit to a Wetland</b>	<ul style="list-style-type: none"> <li>Appreciate the importance of wetlands</li> <li>Acquire knowledge about migratory birds and their behaviour</li> <li>Become familiar with the flora and fauna in and around wetlands</li> <li>Develop the skill of observation and draw conclusions</li> <li>Become aware of the negative effect of urbanization on wetlands</li> </ul>	Science

SECTION I

SECTION II

SECTION III

## SECTION I

12	Biodiversity Awareness	<b>Pollen, Pollen Everywhere</b>	<ul style="list-style-type: none"> <li>• Understand the important role pollen grains play in the life cycle of plants</li> <li>• Develop the skill to make slides and use microscope</li> <li>• Appreciate the diversity in pollen forms present in different plants</li> <li>• Conduct awareness drive in school and neighborhoods for protection to people who are allergic to pollen.</li> </ul>	Science
13	Water Conservation	<b>Water Conservation</b>	<ul style="list-style-type: none"> <li>• gather information on different traditional and modern water conservation techniques</li> <li>• discover how lifestyle changes have affected and brought changes in water conservation practices.</li> </ul>	Social Studies, Science

## SECTION II

### 3.3.1. Activity 10 – Our Butterfly Garden

**Curriculum Linkages:** Science- Habitat/ Interdependence

**Goal:** The disturbances in the eco-system are the main reason for extinction of various species of plants and animals. In this context, the creation of butterfly garden aims at generating awareness regarding the importance of ecological balance.

**Outcomes- The learners would . . .**

- gather data on habitat requirements of butterflies from available literature;
- identify host and nectar indigenous plants for the butterflies;
- explain the life cycle of butterflies;
- sharpen their observation skills; and
- report phenomenon objectively and draw conclusions

## SECTION III

**Duration/ Time:** 30 minutes for orientation; ongoing project- 4-5 months; to be undertaken as per the suitable local climatic conditions/ school calendar

**Material required:** A small designated space, gardening tools, plants that attract butterflies - Marigold, Aster, Sunflower, Celosia (Cocks Comb), Begonias.

### Methodology:

1. The first step is to identify a space to create this garden. The club may seek permission from the school administration for this. The space can be as small as a few square feet outside a classroom to a much larger space in the school garden. Select a site that preferably has trees around it. Make sure that this is a sunny area - flowering plants and the butterflies need ample sunlight.
2. Let the learners clear the weeds, debris etc. from this space. It is advised that a few rocks may be placed strategically to provide shade and shelter for the butterflies.
3. It is important to choose the right plant species for the butterfly garden to thrive. The learners are encouraged to explore library resources to identify local plants that would support the butterfly community (nectar and host plants- on which butterflies lay eggs). They may also study the conditions that would be conducive for the survival of these plants (shade/ sun, soil-moist/dry etc.). Learners may research the varieties of butterflies found in their region and accordingly plan the saplings for the garden.
4. For example, the Common Rose Butterfly lays its eggs on Indian Birthwort –a creeper plant, Spot Swordtail, Common Jay and Tailed Jay lay their eggs on *Polyalthialongifolia*, commonly known as Ashok tree, Common Mormon lays its eggs on *Murrayakoenigii* (Curry Leaf) and *Citrus aurantifolia* (Lime tree)
5. The next step is to grow plants that butterflies feed on. Butterflies need nectar for nourishment. Plant saplings of plant species that will provide nectar for the adult butterflies. Some of the common nectar plants are Lantana, wild Xenia, Ixora and Tridax (coat buttons).
6. The learners must water these plants regularly so that they continue to thrive.
7. As butterflies need a source of water, learners may make a small depression and fill it with water to create a muddy puddle. Butterflies often visit puddles to get their dose of water and minerals. They may also place a small container filled with water. The learners may regularly check this puddle/container to ensure that it is clean and it does not become a breeding ground for mosquitoes.
8. Butterflies get attracted to the plants and approach them to lay eggs. Caterpillars come out of the eggs and start feeding on the leaves. The pupa is an immovable stage in a butterfly's life. In about 8 to 10 days the butterfly is ready to come out. At that time, the pupa starts turning black in colour and then slowly becomes transparent. In a short while, the butterfly

emerges from the pupa. If the learners want to see it coming out, they should keep a watch on it when it starts becoming transparent. It takes about one and a half hours to dry its wings. Now its ready to fly in the garden.

- Learners may be encouraged to observe the life processes of the butterfly and various stages of its life cycle.

### Resources:

- <http://yutaka.it-n.jp> (a checklist of butterflies in Indo-china ) accessed on 02.07.2019
- <https://www.cultureunplugged.com/documentary/watch-online/festival/play/5866/Once-There-Was-a-Purple-Butterfly> (a film on butterflies can be shown to the learners that will set the tone)
- <https://blog.fantasticgardeners.co.uk/start-butterfly-garden/>(blog with detailed information on planning the garden) accessed on 02.07.2019
- <https://entomology.ca.uky.edu/ef006>(blog with detailed information on planning the garden) accessed on 02.07.2019
- <https://nababutterfly.com/start-butterfly-garden/>(website with detailed information on planning the garden) accessed on 02.07.2019
- <https://timesofindia.indiatimes.com/city/delhi/Now-open-A-home-for-butterflies-in-Lodhi-Gardens/articleshow/5140162.cms>(news article) accessed on 02.07.2019
- <https://www.cityflowers.co.in/blog/walking-through-the-delhi-butterfly-park-address-timings-and-how-to-reach-there/>(article on Delhi's butterfly parks) accessed on 02.07.2019
- <https://www.greenmylife.in/creating-butterfly-garden/>
- [https://upload.wikimedia.org/wikipedia/commons/0/03/Butterfly\\_Gardening\\_in\\_India\\_by\\_Dr.\\_Raju\\_Kasambe.pdf](https://upload.wikimedia.org/wikipedia/commons/0/03/Butterfly_Gardening_in_India_by_Dr._Raju_Kasambe.pdf)

### 3.3.2. Activity 11 –Visit to a Wetland

**Curriculum Linkage:** Science, Geography- discovering flora and fauna, migration and water cycle

**Goal:** With the world facing water shortage, erratic rain patterns and species being lost forever, we have now started to understand the unique place that a wetland ecosystem holds. The activity aims at learners understanding the importance of wetlands and the study of avifauna.

**Learning Outcomes: The learners would...**

- appreciate the importance of wetlands
- acquire knowledge about migratory birds and their behaviour

- become familiar with the flora and fauna in and around wetlands
- develop the skill of observation and draw conclusions
- become aware of the negative effect of urbanization on wetlands

**Duration/ Time:** 30 minutes for a class orientation on wetlands and 1 hour on the site.

**Material required:** Note book, pen/pencil, a pair of binoculars, a handbook of birds for identification

### Methodology:

1. Learners should be apprised of what wetlands are and the importance they hold.
2. A brief discussion on how migratory birds come to India's warm hospitable conditions from the countries where water freezes in winters and hence have scarcity of food there. A short film/documentary can be screened in the class.
3. At the site, students need to observe the migratory birds, try to identify different species of birds and the plants in the wetland.
4. They will note down the number of plant and bird species observed. A pair of binoculars will further help them in identification.

### As a follow up task:

- Students to write a report on their trip to the wetland.
- Research on any one wetland plant that is used commercially (vetiver/khus, Foxnuts/ makhana, water hyacinth).
- Research on Siberian cranes that once visited India, after flying tirelessly for more than 6000 km. What could be the reason for these birds not coming to India anymore?

### Additional Resources:

- <https://www.ramsar.org/about/the-importance-of-wetlands>
- <https://www.conserve-energy-future.com/types-and-importance-of-wetlands.php>
- <https://www.ramsar.org/wetland/india>

**Note:** In case a wetland is not accessible, students may be taken to visit any other ecosystem- a pond/an arid zone/ a grassland etc.

### 3.3.3. Activity 12 – Pollen, Pollen, Everywhere.

**Curriculum linkages:** Science- Biodiversity Awareness

**Goal:** Familiarize students about pollen grains and their role in maintaining the density of specific species and creating awareness about diverse types of pollens and pollen allergies.

**Outcomes:** The learners would...

- understand the important role pollen grains play in the life cycle of plants
- develop the skill to make slides and use microscope
- appreciate the diversity in pollen forms present in different plants
- conduct awareness drive in school and neighborhood for protection to people who are allergic to pollens

**Duration:** 30 minutes

**Materials Required:** Slides and cover slips, glycerin, flowers (source of pollen grains), sterilized needle, pipette

#### Methodology:

Many people have a pollen allergy and develop seasonal colds during change of weather, especially coinciding with flowering time of many plants. While this pollen is considered as a bane due to health risk, they play an important role in life cycle of plants. Without pollen grains, plants would not be able to reproduce, and we would completely lose these species. Let the learners carry out two activities- first to understand different types of pollens and second, to create awareness drive for protection against pollen allergy.

#### Activity 12 a. Understanding pollens

1. Engage in a classroom discussion around parts of a plant. Read about reproduction in plants and the role of pollen grains in the process.
2. Ask students to observe diagrams of pollen grain and study its parts. The learners will understand that pollen grains of different shapes and sizes are found in different plants. They are so tiny in size that we would need a microscope to see them.
3. Help students learn how they can make slides and handle a microscope. Show them pictures of pollen grains.
4. Tell students how to mark different kinds of flowers. Mark the name of each flower on each slide.

5. Find flowers with lots of yellow pollen on them. Use a sterilized needle to scrap pollen from the anthers. Collect these in a pipette tip.
6. Load the pollen in glycerin drop placed in centre of a slide. Gently cover with a cover slip.
7. Help the students to observe the slide under microscope and sketch the shape of the observed pollen. Explain how pollen of different flowers have different shapes and sizes.

#### **Activity 12b - Awareness drive for protection against pollen allergy**

1. Awareness campaign may be carried out in school as well as neighborhoods for protection against pollen allergies.
2. Activity may be carried out twice in a year during pollination season – March-April and September – November.
3. Discussion on protection against pollen allergies may be carried out in class and IEC material can be displayed stating easy to follow tips during pollen season for protection against pollen allergies. Some of these are:
  - » Avoid outdoors especially during windy days-late morning and early afternoon
  - » Close the windows in the evening
  - » Bathing after coming from outside
  - » Avoid drying clothes outside
  - » Avoid food items like cheese, pickles, canned juice, butter milk, dry fruits like dates, raisins, figs, and food prepared using vinegar or yeast
  - » In case of high sensitivity, use pollen masks.

#### **Resources:**

- <https://www.youtube.com/watch?v=fUudjaPQFvo>. Last accessed on 29.6.2019
- <https://www.microscopemaster.com/pollen-under-the-microscope.html>. Last accessed on 29.6.2019
- [http://chemistry.armstrong.edu/nivens/Chem3300/Pollen\\_preparation.pdf](http://chemistry.armstrong.edu/nivens/Chem3300/Pollen_preparation.pdf). Last accessed on 29.6.2019

#### **3.3.4. Activity 13 – Water Conservation**

**Curriculum Linkages:** Social Studies, Science

**Goal:** Water, a precious resource across the world. The per capita water availability is constantly reducing due to limited and reducing water resources and increasing population. Our changing lifestyle and easy access to water has further affected the water resources both in terms of quality and quantity. The present activity will create awareness about the present state of water resources and motivate the students to become custodians of water.

**Outcomes:** The learners would. . .

- gather information on different traditional and modern water conservation techniques
- discover how lifestyle changes have affected and brought changes in water conservation practices.

**Duration:** Ongoing activity over 1 week

**Materials Required:** Project file, relevant pictures, articles from newspaper/magazine, information from books/online

### Methodology:

1. Divide the class in six groups – Team A, B, C, D, E & F.
2. Ask each team to conduct a secondary review on
  - Team A** State of groundwater in their state
  - Team B** State of water in the rivers
  - Team C** Change in forest cover and land use pattern
  - Team D** Traditional and modern rainwater systems
  - Team E** Change in rainfall<sup>1</sup>, estimate Rainwater Harvesting (RWH) potential of your school<sup>2</sup>, cost of RWH and subsidy from the Government to construct rainwater harvesting structures in school (in case school doesn't have)
  - Team F** Water misuse in school and home, relevant tips for conservation
3. Ask students to find out information from authentic sources in their teams based on secondary review and make a presentation in class and submit a project report.
4. Ask students to prepare slogans / posters and display information on notice boards / bulletin board and sensitize others in school.

### Discussion:

1. Discuss traditional ways of water harvesting in different parts of India.
2. Do we use more water in our homes today or was water wastage more during our parents and grandparents time? How?

1 Change in last few years and compare it with India and other Indian states

2 <http://www.rainwaterharvesting.org/Urban/ThePotential.htm>



3. What effect present-day habits (use of soap, detergents, shampoo, conditioners etc.) have on water quality and quantity?
4. Has change in land use pattern (reduction in forest cover, construction of concrete structures like roads, buildings) resulted in change in groundwater table?
5. Discuss the possibility of setting up rainwater harvesting system in school.
6. Discuss water saving tips at individual level, school level and community level.

**Resource:**

- <http://www.rainwaterharvesting.org/Urban/ThePotential.htm>. Rainwater harvesting Calculator. Accessed on 18 July 2019.
- <http://cgwb.gov.in/GW-Year-Book-State.html>. Groundwater status, Accessed on 18 July 2019.
- <http://mospi.nic.in/publication/statistical-year-book-india> (Statistical handbook of India) Accessed on 18 July 2019.
- <http://fsi.nic.in/forest-report-2017> (state of forests in India) Accessed on 18 July 2019.
- [http://www.cpcbenvi.nic.in/water\\_quality\\_data.html](http://www.cpcbenvi.nic.in/water_quality_data.html) (river water quality in India) Accessed on 18 July 2019.

### 3.4 Suggested activities for Senior Secondary Level (Classes XI-XII)

Table 3.7 SENIOR SECONDARY LEVEL

S. No.	Theme	Activity	Outcomes The learners . . .	Curriculum Linkages
14	Waste Management	<b>E-waste Drive</b>	<ul style="list-style-type: none"> <li>Develop understanding of e-waste management</li> <li>Conduct awareness drive on e-waste management</li> <li>Facilitate e-waste collection in school and establish linkages with authorized e-waste recyclers</li> </ul>	Science, Computer Science
15	Water Conservation	<b>Awareness Drive on Reuse of Grey Water</b>	<ul style="list-style-type: none"> <li>Know the difference between freshwater, grey water and black water.</li> <li>Acquire knowledge and understanding regarding the usage of grey water for gardening</li> <li>Become familiar with the process of purifying grey water for reuse.</li> <li>Sensitize community to reuse grey water</li> </ul>	Science
16	Climate Change	<b>Calculating Carbon Footprint</b>	<ul style="list-style-type: none"> <li>Develop an understanding of the impact of human activities on the carbon budget in the atmosphere.</li> <li>Acquire knowledge about practices that reduce our carbon footprints.</li> <li>Calculate carbon emissions of different appliances.</li> </ul>	Science
17	Environmental Awareness	<b>Green Living Quiz</b>	<ul style="list-style-type: none"> <li>Become familiar and conversant with green living practices</li> <li>Read and select related information from different available sources like internet, books, magazines, newspapers etc.</li> <li>Develop communication skills, interpersonal skills and confidence.</li> </ul>	Science, Social Science

SECTION I

SECTION II

SECTION III

### 3.4.1. Activity 14 –E-waste Drive

**Curriculum Linkages:** Science, Computer Science

**Goal:** Everyday market is being flooded with new gadgets, upgraded software and hardware, leading to early obsolescence of the electronics and electric equipments. This is putting heavy pressure on the E-waste disposal. The proposed activity will not only apprise students with upcoming threats to humans and environment caused by casual e-waste disposal but also motivate them to sensitize their co-students, friends and neighbors about it.



**Outcomes:** The learners would . . .

- develop an understanding of e-waste management
- conduct awareness drive on e-waste management
- facilitate e-waste collection in school and establish linkages with authorized e-waste recyclers

**Duration:** 1 week for work on the project of e-waste management; Further – 1 month for carrying out awareness drive in school and explore collaboration with authorized e-waste recycler to setting up e-waste collection centre in school.

**Material required:** IEC material on e-waste, films etc.

#### Methodology:

1. Orient the students to the issue of e-waste management using films and presentations. (link for films/clips given below)
2. Now divide the class in 4 teams to develop a project for creating e-waste awareness drive in school. They may develop various activities like street plays, puppet shows, special morning assembly, competitions, IEC material to display in school as class project. (link for training module given below).
3. After a week, each group presents their proposed activities to the entire class. With inputs from teacher, a plan of action is to be finalized by the students for the next 21 days.
4. Students carry out various awareness activities. Also motivate students to bring their old e-waste devices to school for recycling.
5. Within the next 7 days, students may explore the possibility of e-waste collection from their school by an authorized dealer. Once the possibility is worked out, e-waste collection points

may be developed in school. (List of authorized dealers – link provided in resources).

### Resources:

- [https://cpcb.nic.in/uploads/Projects/E-Waste/List\\_of\\_E-waste\\_Recycler.pdf](https://cpcb.nic.in/uploads/Projects/E-Waste/List_of_E-waste_Recycler.pdf) (List and contact details of authorized e-waste recycles in India) accessed on 03.07.2019
- <https://www.downtoearth.org.in/blog/waste/recycling-of-e-waste-in-india-and-its-potential-64034> (understanding e-waste) accessed on 03.07.2019
- <https://www.youtube.com/watch?v=aHaySL8EL6g&feature=youtu.be> (Video animation on understanding e-waste management). accessed on 03.07.2019
- <http://greene.gov.in/> (E-waste awareness program of Government of India) accessed on 03.07.2019
- <http://greene.gov.in/wp-content/uploads/2018/01/Students.pdf> (E-waste training manuals for schools) accessed on 03.07.2019
- <http://toxicslink.org/?q=game-e-waste> (online puzzle game on e-waste). accessed on 03.07.2019
- [https://www.youtube.com/watch?time\\_continue=7&v=2ws8yyCLUYM](https://www.youtube.com/watch?time_continue=7&v=2ws8yyCLUYM) (YouTube animation, understanding e-waste). accessed on 03.07.2019

### 3.4.2. Activity 15 – Awareness Drive on Reuse of Grey Water

**Curriculum Linkages:** Science- Water Conservation

**Goal:** Water resources are dwindling and reclaiming used water is a way out to conserve water. Grey water is the one left after washing hands, utensils, clothes etc., while black water is the one left after toilet use. The activity will make the learners sensitive towards usage of water and conservation of water.

**Outcomes:** The learners would...

- know the difference between freshwater, grey water and black water
- acquire knowledge and understanding regarding the usage of grey water for gardening
- become familiar with the process of purifying the grey water for reuse
- be sensitized to reuse grey water

**Materials Required:** information on grey water and its reuse, resources to develop IEC material like charts, poster, pamphlets etc.

**Duration:** 1 month

### Methodology:

1. Discuss the difference between grey and black water.
2. Discuss how the grey water can be used after the simple process of filtration.

3. Ask them to develop Information Education Communication(IEC) materials like posters, pamphlet and bookmarks etc. on reuse of grey water.
4. Ask them to conduct an awareness drive in their neighborhood community on the importance of reuse of grey water.

### Additional Resources:

- [http://www.iosrjournals.org/iosr-jmce/papers/sicete\(civil\)-volume5/52.pdf](http://www.iosrjournals.org/iosr-jmce/papers/sicete(civil)-volume5/52.pdf). (Greywater - Treatment and Reuse), Accessed on 18 July 2019
- <https://greywateraction.org/greywater-reuse/>
- <https://www.youtube.com/watch?v=GTGFWRZr9pY> (YouTube Video on grey water), Accessed on 18 July 2019
- <https://swachhindia.ndtv.com/four-step-guide-grey-water-recycling-home-19154/> (A Four Step Guide To Grey Water Recycling At Home), Accessed on 18 July 2019
- <https://www.indiawaterportal.org/articles/greywater-recycling-toilet-use>

### 3.4.3. Activity 16 – Calculating Carbon Footprint

**Curriculum Linkages:** Science- Anthropogenic factors affecting environment, Mathematics

**Goal:** The human-activity impact of an individual, event, organization, or product which produces greenhouse gases is usually expressed in carbon dioxide equivalent, also known as carbon footprint. Through this activity, learners would be acquainted with this concept and with some simple and easy-to-practice measures like switching over to energy conserving appliances, switching to environment friendly mode of travelling, less usage of paper and switching over to digital payments to reduce carbon footprint.

**Outcomes:** The learners would . . .

- develop an understanding of the impact of human activities on the carbon budget in the atmosphere.
- acquire knowledge about practices that reduce our carbon footprints.
- calculate carbon emissions of different appliances.

**Duration:** 60 minutes

**Materials Required:** Notebook, pencil

**Methodology:**

1. Have a discussion on the effect of rising levels of greenhouse gases, particularly carbon dioxide and the impact it has on the earth, a day prior to the activity.
2. The class is divided into groups and assigned tasks as follows:
  - » Group 1 to go around the school to find out the number of fans, water coolers and air conditioners in the school and if they are regular fans or Bureau of Energy Efficiency (BEE) rated fans.
  - » Group 2 to enquire from the school printing room about the number of paper reams used and if both sides of the paper are used for printing.
  - » Group 3 to count the number of trees that the school has.
3. On gathering the data, the learners get back to the class and will do some simple calculations to find out the carbon emissions of the school and how it could be reduced.
4. The learners discuss their data analysis group wise.
5. They brainstorm on other daily activities which contribute to their carbon footprints and can easily be amended without affecting the lifestyles

Appliance	Wattage (W)	Daily use (hrs)	Electricity consumption annually(kWh)	Annual CO <sub>2</sub> emission (Kg)	Electricity cost (Rs/kWh)	Annual cost
Regular fan						
BEE 3 star rated fan						
BEE 4 star rated fan						
Savings						

Activity	No of sheets / month	Weight of paper conserved annually (kg)	kg CO <sub>2</sub> emitted per kg of paper	Annual CO <sub>2</sub> emissions (kg) reduced by
Reduce printing by 1 ream				
Print on both sides				

No of trees	CO <sub>2</sub> /kg sequestered by one tree/year	Reduction of CO <sub>2</sub> /kg for 100 years
1	3.66 to 10kg	183-500

**Resources:**

- <https://www.carbonfootprint.com/calculator.aspx>
- <https://www.digit.in/technology-guides/fasttrack-to-going-green/calculate-your-carbon-footprint.html>

### 3.4.4. Activity 17 – Green Living Quiz

**Curriculum Linkages:** Science

**Goal:** Student’s knowledge about green living practices and the environment will be assessed.

**Outcomes:** The learners . . .

- become familiar and conversant with green living practices
- read and select related information from different available sources like internet, books, magazines, newspapers etc.
- develop communication skills, interpersonal skills and confidence

**Duration:** 40 minutes

#### Methodology:

1. The teacher may divide the class into 2 teams.
2. The teacher can take support of 1-2 students and conduct the quiz. Pre-determined rules may be followed.
3. The winning team may be given certificates of appreciation.

#### Resources:

- <https://www.nationalgeographic.com/environment/global-warming/green-lifestyle-quiz/>
- <https://www.proprofs.com/quiz-school/story.php?title=how-well-informed-are-you-about-green-living>
- <https://www.jagranjosh.com/general-knowledge/gk-questions-and-answers-on-sustainable-development-and-sustainability-1504851478-1>
- <http://edugreen.teri.res.in/explore/quiz/quiz-climate/quiz01.htm>

#### Some Sample Quiz Questions

1. What type of bag is more eco-friendly, cloth or plastic?
  - a. Plastic
  - b. Cloth
  - c. Either is fine

## SECTION I

2. Appliances that are turned-off don't use electricity.
  - a. True
  - b. False
3. Approximately how much global electricity output is produced from renewable sources?
  - a. 50%
  - b. 20%
  - c. 1%
  - d. 10%
4. During a long trip, you conserve more fuel by driving fast than by going at a slow speed.
  - a. True
  - b. False

## SECTION II

5. Permaculture can only be achieved in a large rural place setting.
  - a. True
  - b. False
6. Structural Insulated Panels (SIP) when properly installed
  - a. Eliminate the infiltration and ex-filtration of air
  - b. Serve as a dramatic noise reduction mechanism
  - c. Are mold, mildew and fire resistant
  - d. All of the above
  - e. None of the above

## SECTION III

7. Harvesting of rainwater is unsafe and unhealthy.
  - a. True
  - b. False
8. Carbon footprint is
  - a. The total amount of greenhouse gases produced to directly or indirectly support human activities usually expressed in equivalent tons of carbon dioxide (CO<sub>2</sub>)
  - b. The amount of carbon produced by healthy green habits
  - c. The right path on creating a more sustainable earth



9. Which of the two uses less water – washing utensils by hand or in a dishwasher?
  - a. By hand
  - b. Dishwater
  
10. Hybrid cars are slower than conventional cars.
  - a. True
  - b. False
  
11. What is the ideal temperature for AC to conserve energy?
  - a. 20°C
  - b. 22°C
  - c. 24°C
  - d. 26°C
  
12. When did the term 'Sustainable Development' come into existence?
  - a. 1987
  - b. 1980
  - c. 1978
  - d. 1992
  
13. Which of the following UN Commission is responsible for reviewing progress in the implementation of Agenda 21 and the Rio Declaration on Environment and Development?
  - a. United Nations Disarmament Commission
  - b. United Nations Statistical Commission
  - c. United Nations Commission on Sustainable Development
  - d. United Nations on Human Rights
  
14. Which of the following is the most widely discussed impact of climate change?
  - a. Increase in average sea level
  - b. Deforestation
  - c. Soil erosion
  - d. Erratic rainfall

15. The term used for the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings is
- Core conservation
  - In-situ conservation
  - Ex-situ conservation
  - Peripheral conservation

**Key**

1 - b	6-c	11- d
2- a	7-b	12-a
3- b	8-a	13 -c
4-b	9-b	14 -a
5-a	10-b	15 -b

# REFERENCES



# REFERENCES

- CBSE. (NA). CBSE | *Central Board of Secondary Education*. Retrieved from <http://www.cbse.nic.in>
- CBSE. (2005). Delhi: Circular No. 08/2005 dt 1st Feb.
- CEE. (NA) Summer Programme, Children, Activity, Vacation, Nature, Arts, CEE. (n.d.). Retrieved from <https://www.ceeindia.org>
- CEE & Vikram Sarabhai Community Science Centre. (2008). *Joy of learning. Handbook of environmental education activities. (For standard 6 to 8 school children)*. In collaboration with Viksat & Dapana Academy of Performing Arts, Ahmadabad.
- Constitution of India, Part IV—Directive Principles of State Policy— Arts. 48A—51.
- Government of India, MHRD. (1986). *Environmental education in national policy documents*. National Policy In Education, (with modifications undertaken in 1992).
- Government of India, (NA). *Best practice awareness generation in children about environmental issues. Madhya Pradesh*. RCVP Noronha Academy of Administration and Management. Accessed <https://darp.gov.in/sites/default/files/45.%20Awareness%20generation%20in%20Children%20about%20Environmental%20issues.pdf>
- Government of India, Ministry of Water Resources. (2005). *General guidelines for water audit and Water Conservation*. New Delhi: Central Water Commission, Evaluation of water utilization directorate.
- GSP (*Green Schools Programme*) Audit 2016. (2016). Retrieved from <https://www.greenschoolsprogramme.org/GSP-Audit2016-Questions.pdf>
- Janaagraha. (NA). *Teacher's guide: A precious resource. Period 3, Based on the NCERT curriculum for standard VII, Janaagraha centre for citizenship and democracy*. Accessed on [http://ylacindia.com/wp-content/uploads/2018/10/Water-a-precious-resource\\_Lesson-Plan-3-15Oct18.pdf](http://ylacindia.com/wp-content/uploads/2018/10/Water-a-precious-resource_Lesson-Plan-3-15Oct18.pdf)
- Matarasso, M. & Dung, N.V. (NA). *Environmental education trainer's guide for nature conservation*. Accessed: <https://www.csu.edu/cerc/researchreports/documents/EnvironmentalEducationTrainersGuideForNatureConservation2002.pdf>
- *National Green Corps, Campaign and Programmers*. (NA). Retrieved from [http://ylacindia.com/wp-content/uploads/2018/10/Water-a-precious-resource\\_Lesson-Plan-3-15Oct18.pdf](http://ylacindia.com/wp-content/uploads/2018/10/Water-a-precious-resource_Lesson-Plan-3-15Oct18.pdf)
- NCERT. (NA). *Environmental education as infused in NCERT syllabus for classes I to XII as per NCF 2005*. New Delhi: Department of Education in Science and Mathematics.
- NCERT. (2005). *National Curriculum Framework 2005*. Accessed: <http://www.ncert.nic.in/>

rightside/links/pdf/framework/english/nf2005.pdf

- NCERT. (2011). *Teacher's handbook on environmental education for classes XI-XII*. New Delhi: NCERT, Department of Education in Science and Mathematics.
- NCERT. (2015). *Resource book; Towards a green school on education for sustainable development for elementary schools*. New Delhi: NCERT.
- Sustainable Victoria ENG063 (2016). Water efficiency in schools. A practical 'how to' guide for Victorian schools. Australia: Sustainability Victoria. Accessed file:///C:/Users/hp/Downloads/RSS%20water%20how%20to%20guide%20PDF%20version%20(1).pdf
- *United Nations Environment Programme (UNEP)*. (2016, November 8). Retrieved from <https://in.one.un.org/who-we-are/unep-india/>
- UNESCO. (1985). *Environmental Education: Module for Pre-Service Training of Social Science Teachers and Supervisors of Secondary Schools*. Retrieved from [http://www.unesco.org/education/pdf/333\\_14.pdf](http://www.unesco.org/education/pdf/333_14.pdf)
- Water Corporation. (2018). *School water audit: A step by step guide to improving water efficiency in schools*. Australia: Water Corporation.
- World is at risk of 'climate apartheid,' warns U.N. (n.d.). Retrieved from <https://www.weforum.org/agenda/2019/06/world-is-at-risk-of-climate-apartheid-warns-u/>
- (2019). Retrieved 14 August 2019, from <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>

# ANNEXURE I

## Environmentally Important Days

ENVIRONMENTALLY IMPORTANT DAYS	
<b>February</b>	
Feb-02	World Wetlands Day
Feb-27	International Polar Bear Day
Feb-28	National Science Day
<b>March</b>	
Mar-03	World Wildlife Day
Mar-14	International Day of Action for Rivers
Mar-20	World Sparrow Day
Mar-21	World Forestry Day, World Planting Day, World Wood Day
Mar-22	World Water & Sanitation Day
Mar-23	World Meteorological Day, World Resources Day
<b>April</b>	
Apr-07	World Health Day
Apr-10	World Atmosphere Day
Apr-18	World Heritage Day
Apr-22	World Earth Day
<b>May</b>	
May-03	International Energy Day
May-08	World Migratory Bird Day
May-11	National Technology Day
May-14	Endemic Bird Day
May-22	World Biodiversity Day
May-23	World Turtle Day
<b>June</b>	
Jun-05	World Environment Day
Jun-08	World Ocean Day
Jun-09	Coral Triangle Day
Jun-15	Global Wind Day
Jun-17	World Day to Combat Desertification and Drought

<b>July</b>	
July 1 – July 7	Van Mahotsav Saptah
Jul-03	World Seabird Day
Jul-11	World Population Day
Jul-26	International Mangrove Day
Jul-29	International Tiger Day
<b>August</b>	
Aug-10	World Lion Day
Aug-12	World Elephant Day
Aug-22	Honey Bee Day
<b>September</b>	
Sep-08	World Cleanup Day
Sep-16	World Ozone Day
Sep-18	World Water Monitoring Day
Sep-21	Zero Emissions Day
Sep-26	World Environmental Health Day
<b>October</b>	
October 1 – Oct 7	Wildlife Week
Oct-03	World Nature Day, World Habitat Day
Oct-04	World Animal Day
Oct-06	World Wildlife Day
Oct-24	International Day of Climate Action
<b>November</b>	
Nov-06	International Day for Preventing the Exploitation of the Environment in War and Armed Conflict
Nov-12	World Birds Day
Nov-14	World Energy Conservation Day
<b>December</b>	
Dec-05	World Soil Day
Dec-11	International Mountain Day
Dec-14	National Energy Conservation Day

**Source:**

Important Days - National and International.

Retrieved from [http://www.wiiervis.nic.in/KidsCentre/ImpDays\\_8019.aspx](http://www.wiiervis.nic.in/KidsCentre/ImpDays_8019.aspx)





REDMI NOTE 5 PRO MI DUAL CAMERA



REDMI NOTE 5 PRO MI DUAL CAMERA



REDMI NOTE 5 PRO MI DUAL CAMERA



REDMI NOTE 5 PRO MI DUAL CAMERA

