

# PROJECT BOOK IN ENVIRONMENTAL EDUCATION FOR CLASS VIII



राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्  
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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## FOREWORD

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The National Curriculum Framework (NCF) – 2005, recommends that children's life at school must be linked to their life outside school. This recommendation has been implemented in the new textbooks published since 2006, in all major subjects. In the context of environment-related awareness, NCF-2005's vision implies an approach which cuts across the traditional boundaries separating one subject from another. According to this approach, knowledge of environmental concerns and the activities, which might deepen this knowledge and develop a positive attitude, need to be infused in the subject matter of all areas of the school curriculum at different stages. *The National Focus Group on Habitat and Learning*, which amplifies the NCF-2005, perspective, says: "The human habitat displays tremendous variability in space and time and its understanding has to be locale specific albeit in the context of a global vision. A great deal of the knowledge of the environment lies with India's barefoot ecologists, the people at the grassroots..."

NCF-2005, perceives school children as ecologists in their own right who need to be nurtured by a flexible school routine and teachers who engage with children in the construction of knowledge. In addition to the environment-related subject matter and activities incorporated in the syllabus and textbooks of all the major subjects, the National Council of Educational Research and Training (NCERT) has now decided to bring out project books for students of Classes VI to X. The books comprising this series attempt to build capacity for critical and multi-disciplinary thinking and a positive and problem-solving attitude. They aim at exposing students to the real-life world around them, both in nature and society, in order to enable them to examine, assess and interpret the problems and concerns related to the environment. The ultimate goal is to promote a socio-cultural ethos which facilitates India's attempt to pursue the path of ethically sound and sustainable development. The activities included in this series of books require extensive and continuous observation and

documentation which would enable students and teachers to notice patterns in phenomena. Uploading of the results of such projects on publicly accessible websites will gradually help the nation to create a transparent and comprehensive database on the environment.

The success of this effort crucially depends on the interest and enthusiasm that school principals, teachers, parents and civil society in general show in encouraging children to carry out the projects and activities outlined in the present series. It is extremely important that students' project work is assessed in a holistic manner, giving due regard to the motivation and enthusiasm of each student rather than through the conventional system of evaluation which ignores individuality and originality.

NCERT appreciates the hard work put in by the Project Book Development Committee in preparing this series and we are especially grateful to Professor Madhav Gadgil for guiding the work of this Committee. Several teachers contributed to the development of this book; we are grateful to their principals for making this possible. We are indebted to the institutions and organisations which have generously permitted us to draw upon their resources, material and personnel. NCERT is thankful to Professor Mrinal Miri and Professor G.P. Deshpande who co-chaired the National Monitoring Committee appointed by the Ministry of Human Resource Development to oversee the implementation of NCF-2005. We thank Dr Kiran Chhokar, Programme Director, Centre for Environmental Education, Delhi, for her invaluable inputs during the meeting of the National Monitoring Committee. As an organisation committed to systemic reforms and continuous improvement in the quality of its products, NCERT welcomes comments and suggestions which will enable us to undertake further revision and refinement of this important series.

New Delhi  
9 January 2009

*Director*  
National Council of Educational  
Research and Training

## NOTE TO THE STUDENTS

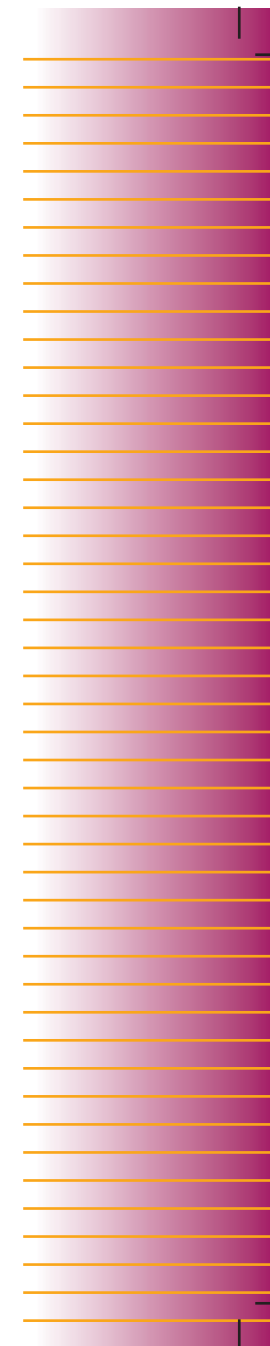
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By now, you must have gained a lot of experience about working on projects on some of the environmental issues of your locality. Yet there remain many other environmental problems that need to be taken care of. So as to enable you to take up such problems, the project book development team has prepared another set of twenty projects.

As in the previous classes, you may have to modify some of the methodologies suggested in the project book to make it suitable to your surroundings. Make the most of these experiences that you have gained in the previous two classes. Modify the methodologies based on such experiences. Bring it to the knowledge of your concerned teacher while making such changes.

Like the previous years, we understand that you will not be able to carry out all the suggested projects. We still recommend you to undertake as many projects as possible. Regarding group projects, we hope by now you would be much comfortable working with your peers with each one of you giving equal contribution. We would like to remind you again that on occasions of visit to officials of different departments, elders, politicians, doctors, scientists, houses, etc. ensure that you obtain prior permission or seek appointment or take an authorisation letter from your school authorities. Be humble, soft spoken and never use coercion while taking an interview or obtaining information and do not hurt the sentiments of others. Take your teacher's help wherever necessary during your project work.

Put in serious effort into your project, as your contribution would be significant in making the environment a better and safer place to live. *'When we heal the earth, we heal ourselves'*.



# **THE CONSTITUTION OF INDIA**

## **PREAMBLE**

**WE, THE PEOPLE OF INDIA**, having solemnly resolved to constitute India into a **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 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.**

## NOTE TO THE TEACHERS

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As in the previous classes, during the course of the development of textbooks of different stages, irrespective of the subjects, utmost care was taken to adequately infuse environmental issues and concerns wherever it found its relevance. Adequate opportunities have been provided to students to actively engage themselves in activities pertaining to environmental concerns. This project book has also been prepared to further students' involvement and active participation in environmental issues. This will enable them to understand the environmental problems in their vicinity, work on them to obtain first hand information, and come out with their own solution. This book, contains twenty projects with the headings — title, background, methodology, conclusion and activities that can be taken up as follow up actions. The topics have been chosen keeping in view the environmental concerns that have been discussed in various textbooks for the class. An attempt has been made to make the projects workable in different corners of the country. However, modifications in the methodology or in the title itself are expected to meet the diverse local specific environmental concerns of different regions.

At this stage, the students have become quite familiar on the ways of handling projects. Yet the role of teachers as a facilitator and guide will still be instrumental for the successful completion of the projects. For this, teachers would be required to assign appropriate projects to each student, modify and fine tune the methodologies, keep track of the developments and also help the students wherever necessary to complete the task smoothly. Teachers are expected to ensure that students take up as many projects as possible but with a minimum of two projects by each student.

Evaluation strategy can be prepared independently by the teacher concerned to evaluate the projects. The teacher concerned will decide whether evaluation should be done for every step of the project or on completion of each project. Whether marks or grades are to be allotted is left to the discretion of the teacher or the school authorities. Whatever pattern the teacher or school employs for evaluation, the marks or grades should be shown in the students' report card. There should be no pass or fail grading. Every student should have completed a minimum of two projects at the end of the academic session and thus should be considered pass.

Last, but not the least, this attempt of introducing project book is to bring about attitudinal change in the students towards environmental concerns and nurture them to become a concerned and responsible citizen.



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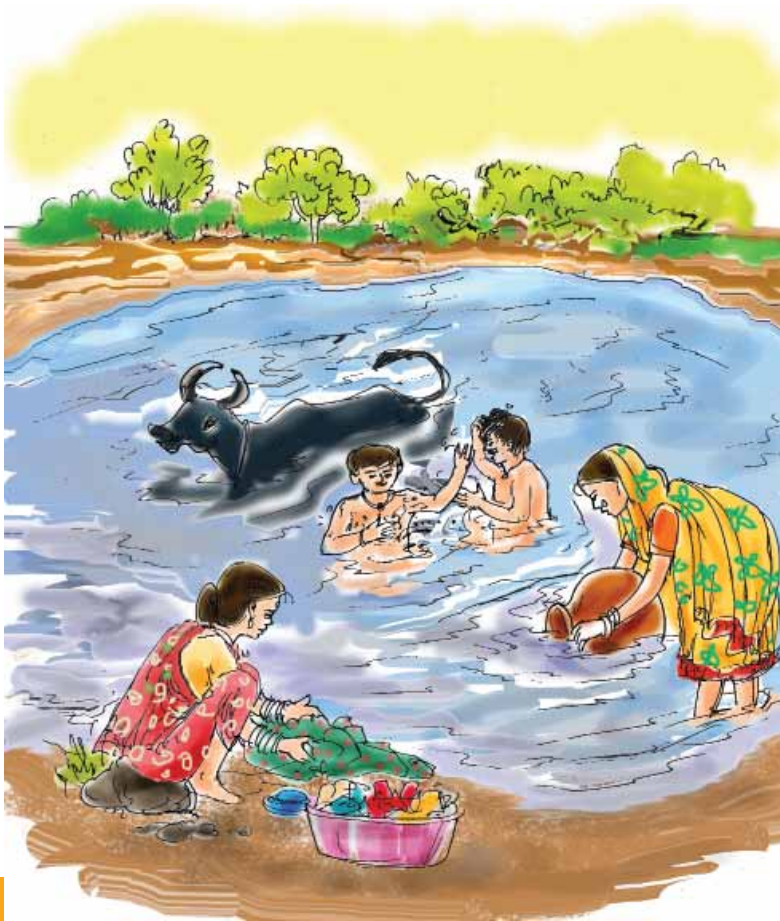
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*When we heal the earth, we heal ourselves*  
~ David Orr

## 1. Elixir of life – water



### Background

Discharge of sewage into water bodies, such as rivers, lakes, and streams is hazardous to human health and also to aquatic flora and fauna. Pollution of water systems may cause outbreak of diseases like diarrhoea, dysentery, cholera, typhoid, etc. Contamination of water with certain chemicals is also a health hazard. Treatment of polluted water for human use requires large expenditure. Health problems, together with the cost of treating water, affect our economy.

### Objectives

- (i) To be sensitised about the effect of discharge of sewage into water bodies.
- (ii) To be aware of the fact that polluted water is harmful for health.

## Methodology

1. Visit a river, canal, pond, well, or any source of water (treated or untreated) in your locality and observe and note the activities going on which may be contaminating the water body.
2. Visit a doctor or a health department official and collect information about diseases like dysentery, diarrhoea, typhoid, cholera. Also collect information about the number of people suffering from these diseases.
3. Find out if there are localities where water-borne diseases are more prevalent. If so, find out the source of water.
4. Visit a water treatment plant and find out whether the cost of treatment varies with the level of contamination/pollution.

## Conclusion

Present the information collected by you in the form of a report.

## Follow-up

Try to visit a waste water treatment plant in your vicinity. Observe how it functions.

Factories and thermal power plants release water that has been used as part of their cooling process into nearby streams and other water bodies. This heated water raises the temperature of the water body and affects the aquatic life in the water. This is known as thermal pollution.



## 2. Noise pollution

### Background



There are some natural and some man-made sources of sound. Some sounds may be pleasant while some others may be unpleasant. Chirping of birds, blowing of breeze, rustling of leaves, music are some examples of pleasant sounds. Sounds near place of stone cutting, quarrying, in a factory or workshop, crowded places, of fire crackers, loud music are some examples of unpleasant sounds or noise. Unpleasant sound

causes discomfort and irritation. Prolonged exposure to high intensity sound causes various ailments, including loss of hearing.

### Methodology

1. Go for a morning walk each day for a week. Concentrate on the various sounds. Listen carefully.
2. Try to identify the sources of those sounds.
3. After coming back, write down your observations in the given table.



### Objectives

- (i) To develop a sense of appreciation about some natural and man-made sources of sound.
- (ii) To explore the impact of unpleasant sounds and noise pollution.



Sl. No.	Type of the sound	Source of sound	Pleasant/Unpleasant
1.	Chirping	Birds	
2.			
3.			
4.			
5.			

- Visit a nearby crowded market, construction site, factory or a workshop where stone cutting is done or a busy road crossing. Note your observations in the table.
- Interview people working in such noise polluted areas and find out whether continuous exposure to noise creates discomfort to them, whether there are any symptoms of irritation in their behaviour or do they suffer from loss of hearing.



## Conclusion

Prepare a report on your study with the help of information collected by you.

## Follow-up

- Suggest at least five ways of minimising unpleasant sounds in your surroundings.
- Tape the sounds at different localities/places and play them in the class. Ask each individual which of these sounds are unpleasant to them.

### 3. Global warming

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#### Background

Greenhouse gases trap radiation and prevent heat from leaving the earth's surface. In the process they help to maintain the temperature of the earth. Excess presence of these gases in the atmosphere causes global warming.

#### Methodology

1. Take two identical glasses of the same material. Put equal quantity of water in them (half filled).
2. Note the temperature of water of both the glasses using a thermometer.
3. Place both the glasses out in open space so that sunlight directly falls on them.
4. Invert a glass bowl or a jar over one glass such that it is covered completely.
5. Atleast after two hours, note the temperature of water in both the glasses.
6. Note the difference in temperature of the two samples. Note which one is hotter.
7. Repeat the experiment with equal amount of ice in the two glasses instead of water. Note the time taken by ice to melt completely.

#### Objective

To investigate the impact of greenhouse effect through simulation.

8. Try to find out the reasons for difference in the temperature of water and the time taken for melting of ice.

## Conclusion

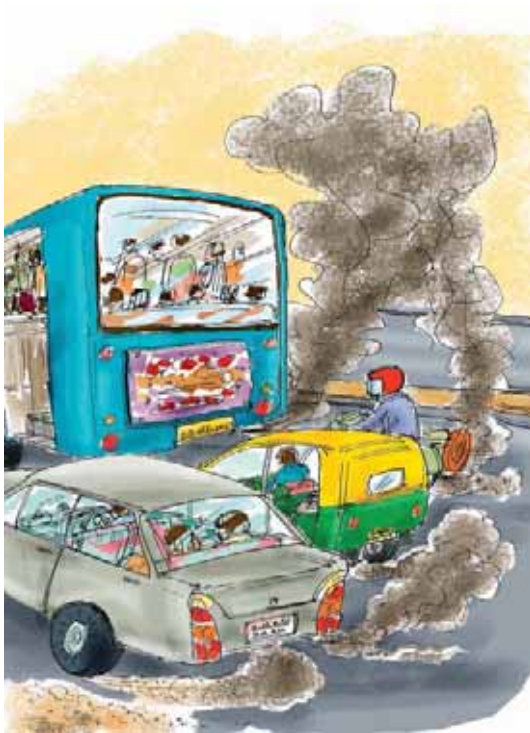
Relate your observations on global warming.

## Follow-up

1. Observe the temperature of the interior of two similar cars parked in the sun, one with its window glasses completely rolled up and the other with window glasses rolled down. Take the temperatures again after two hours.
2. Collect news items relating to global warming and its impact appearing in newspapers and magazines.



## 4. Estimation of particulate pollutants in air



### Background

Solid particles and liquid droplets present in air are called particulate matter. Their presence in air beyond a certain limit is one of the causes of air pollution. Dust particles, pollen grains, smoke, vehicular exhaust, fly ash, coal dust, cement and mist are some of the examples of particulate matter in air. Higher concentration of particulate matter in air prevents solar radiations from reaching the earth's surface. At the same time they also prevent heat to escape from the earth's surface. The net effect of these two phenomena is one of the causes of global warming. They absorb light and reduce visibility, and cause various respiratory diseases.

### Methodology

1. Take six similar clean glass plates/slides. Mark them with numbers from one to six with a marker pen. The number should be written in a laterally reversed manner so that you can easily read it from the other side. Alternately, you can write the numbers on paper and paste them on slides.
2. Coat the other side of each slide with petroleum jelly.

### Objective

To be aware of the fact that particulate matters are one of the pollutants of air.

3. Place the slides with coated side up at different places of your house, such as in open space (at the terrace), on the window sill, in different rooms, inside a table drawer, in the garden. Note the serial number of the slide kept at each site.
4. After one week, remove all the slides and place them on a sheet of white paper with coated side up.
5. Observe the slides with a magnifying glass or with a microscope to estimate the amount of particulate matter deposited.
6. Note down your observation in the form of a table given below.

Slide No.	Location of the slide	Estimated deposition of particulates
1.	Terrace	Thickly deposited
2.	Window sill	
3.	Bedroom	
4.	Kitchen	
5.	Inside a drawer	

## Conclusion

Draw a conclusion on the basis of your observation. Did all the slides gather equal amount of particulate matter? Discuss with your teacher/ neighbour, the possible sources of particulate matter at your location. Prepare a report of your findings.

## Follow-up

Repeat this activity in different seasons. You may also perform it in your school/market/factory/busy roads.

## 5. Death trap

### Objective

To be sensitised to the need for adopting proper practices to dispose of wastes.

### Background

It is observed that people dispose of waste materials like peels of banana, water melon, coconut, and lubricating oil indiscriminately. This is one of the causes of injury due to fall and road accidents. Sand and gravel for construction and road repairs are often dumped on the road side and in public places. All these make the surroundings dangerous as well as dirty.

### Methodology

1. Collect information from your neighbourhood about accidents involving slipping of individuals, or skidding of vehicles due to indiscriminate disposal of wastes and dumping of building materials on the roads.
2. Also visit the casualty wards of some hospitals to collect information about the number of people injured due to road accidents caused by such negligence.
3. Collect the information for a period of over three months.



## Conclusion

Prepare a report on the basis of information collected by you, citing examples of accidents caused due to these inadvertent actions.

## Follow-up

1. Develop a campaign for safe disposal of waste material.
2. Develop scripts and stage *nukkad nataks* (street plays) on the issue of waste disposal.

In India, 75,000 people lose their lives in road accidents, and over 3,25,000 are injured every year on an average.



## 6. Where should the waste go?

### Background

Different materials decompose, or rot, at different speeds under different conditions. There are materials which do not decompose easily and take a long time. Waste materials are hazardous to the environment if not properly disposed off.

### Methodology

1. Start from your own home; try to find out the various types of waste that are generated. Categorise them into groups of materials that decompose easily and that do not decompose easily.
2. Find out whether in your house, or houses in your neighbourhood, these household wastes are kept separately before disposal or kept together and disposed off.
3. Make a list of materials present in the waste collected from your house. Dump this waste in a pit near your house or in a big pot/ bucket, sprinkle soil over it and cover it completely.
4. Cover it properly with a plastic sheet/sack to prevent the foul smell from escaping and breeding of flies, etc.
5. Examine the waste dump every ten days and see the things which you can still recognise. Note your observations. If the dump has dried, sprinkle water to make it wet and cover it again as before.

### Objectives

- (i) To be able to classify different types of waste materials depending upon the rate of their decomposition or rotting.
- (ii) To be able to suggest suitable ways for household solid waste disposal.



6. Repeat the above step for five more times.
7. After 60 days, list the materials that you can still recognise.

## Conclusion

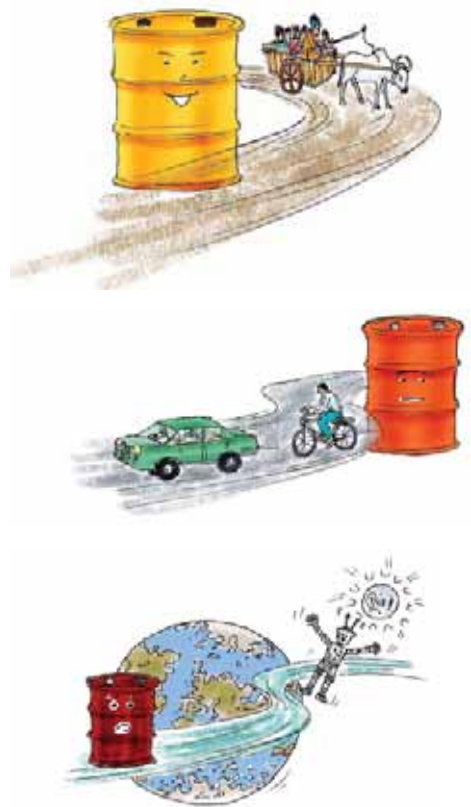
Make a report of your study giving examples of materials that decompose easily, at a slower pace and those which do not decompose at all. Also suggest suitable ways for disposal of different types of waste.

## Follow-up

Find out which materials can be recycled and used again.



## 7. Fossil fuel is not forever



### Background

Fossil fuels which are one of the basic sources of energy for all our activities are exhaustible. For example, coal, kerosene, and LPG are sources of energy for cooking, heating, burning in our households. Petrol and diesel used for transport and in industry are also derived from fossil fuels. A large fraction of electricity is produced by burning coal. Fuel wood, though renewable, is fast depleting due to excessive use. By judicious use of these resources one can conserve fossil fuels and reduce the cost of living.

### Methodology

1. Visit atleast 10 houses in your neighbourhood and find out the types of fuels used for cooking, heating and boiling of food and water.

### Objectives

- (i) To be sensitised about the judicious use of energy fossil fuels.
- (ii) To think and suggest ways of conserving fossil fuels.

2. Also find out the type and condition of the *chulha* (cooking stove), burner, oven, etc. used for the purpose.
3. Find out the average consumption per month in terms of money.
4. Find out the sources of leakage or wastage of energy, if any.
5. Record your observations.
6. Discuss with members of families as to how consumption of fuels can be reduced.

## Conclusion

Prepare a report.

## Follow-up

1. Suggest steps to reduce the consumption of electricity or other fuels in your school (specially where mid-day meal is prepared in the school).
2. Encourage people to use solar water heater and solar cooker.

There is a finite amount of fossil fuel found on Earth. In terms of years of production left, Oil = 45 years, Gas = 72 years, Coal = 252 years. This means our supply of non renewable fossil fuels is very limited.

## 8. Judicious use of fuels



### Background

The known reserves of coal and petroleum will last, at most, a few hundred years. It is therefore necessary to use these fuels only when absolutely necessary. This will result in better environment and their availability for a longer period of time. In India, the Petroleum Conservation Research Association (PCRA) advises people on how to save petrol or diesel while driving.

### Methodology

1. Survey at least 10 houses in your neighbourhood about the number of vehicles being used by them and how many people travel by these at a time. Find out if they share vehicles or go by separate vehicles.
2. Ask about the frequency of servicing of their vehicles.

### Objective

To be aware about the judicious use of fossil fuel.

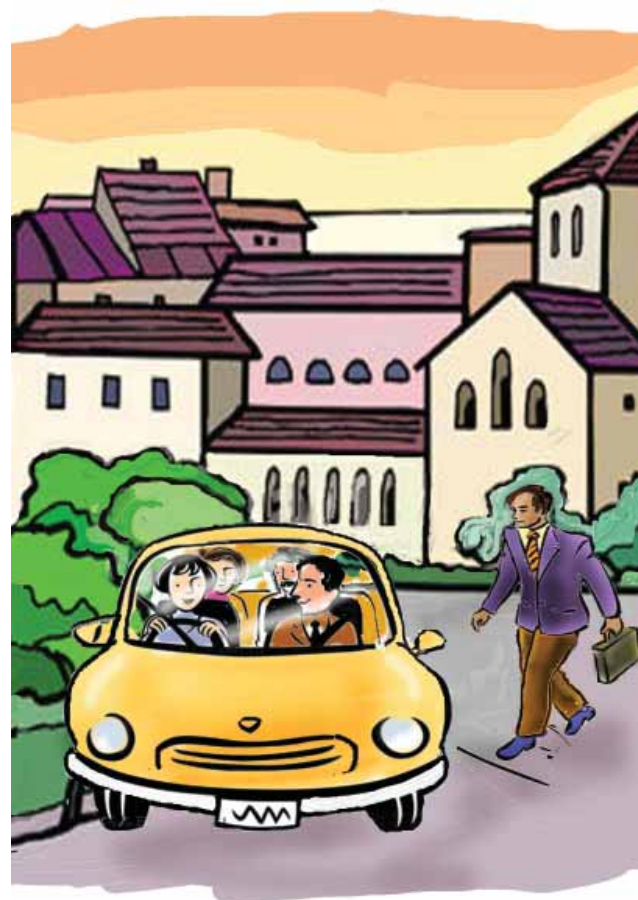
3. Prepare a chart on the types of vehicles and the frequency of their servicing.
4. Ask about the driving speed of their vehicles. Procure booklets from PCRA and compare their speed with the speed advised by PCRA.
5. Ask about the average mileage being given by their vehicles.
6. Observe, at a busy road crossing, the average time for which vehicles stop. Every time the light turns red, count the number of vehicles waiting for the light to turn green. Also note how many drivers switch off the engine of their vehicles while waiting at the traffic signal.

## Conclusion

Make a brief report reflecting to what extent people are adopting measures for using fuels judiciously.

## Follow-up

Prepare slogans on conservation of fuels and campaign for it in your neighbourhood.





## 9. Diseases and their prevention



### Background

There are several types of microorganisms, such as bacteria, viruses, protozoa, fungi, etc. in our surroundings. Many of these cause diseases in human beings, some of which are very common. The disease causing microorganisms can enter our body through water, touch, food, vectors and carriers. But if proper preventive measures are taken, we can definitely protect ourselves from many of the diseases.

### Objectives

- (i) To know microorganisms that cause diseases in human.
- (ii) To find out some preventive measures against those microorganisms.

## Methodology

1. Make a list of as many diseases as possible that are caused by microorganisms.
2. Group the diseases separately into those caused by bacteria, viruses, protozoa and fungi.
3. Try to find out how these are transmitted. Try to find out this information for as many microorganisms as possible.
4. Find out how you can protect yourself from being infected by those microorganisms. For this, you can take the help of your family doctor or a doctor in your locality. You can also refer to books, publicity material of health department, the internet and other sources.



Hand-washing with soap is the most efficient and the least costly way to prevent deaths by diarrhoea, cholera and/or pneumonia. To highlight this aspect and inculcate the habit of hygiene among kids Global Hand Wash Day (GHWDD) is observed on October 15 across the world.

## Conclusion

Prepare a chart of the diseases alongwith the microorganisms that cause them and the preventive measures suggested for those diseases.

## Follow-up

1. Share the information that you have collected with your family and friends.
2. Follow the preventive measures that are suggested by the doctor.

## 10. Mosquitoes woes



### Background

It is commonly observed that as monsoon sets in people suffer from many diseases caused by mosquito bites. Some of such diseases like malaria, dengue, chikungunya, etc. are more common in specific periods of the year, such as the rainy season, etc.

### Methodology

1. Visit a medical doctor, or consult a health worker, or refer to books and the internet to learn about the types of diseases caused by mosquito bites. Also ask about the microorganisms that cause these diseases.
2. Find out the names of different kinds of mosquitoes that cause each of the diseases. Also collect pictures, drawings, photographs of different kinds of mosquitoes.

### Objectives

- (i) To develop awareness about the diseases spread by mosquitoes.
- (ii) To find preventive measures for such diseases.



3. Find out the breeding grounds of mosquitoes (for example, stagnant water).
4. Look around your house/locality and see if there are any breeding places for mosquitoes.
5. Find out what measures you should take to protect yourself from these diseases.

## Conclusion

Prepare a report based on the information collected by you.

## Follow-up

1. Prepare a five minutes speech or a presentation about the information that you have collected and present it in your class.
2. Prepare a slogan and a chart about diseases spread by mosquitoes and their preventive measures, and display it in the entrance of your building or school.
3. Make a scrapbook of clippings about malaria and dengue from newspapers.
4. Prepare a chart showing the symptoms of diseases spread by mosquitoes.



## 11. Vaccination – A shield

### Background

Vaccination is done to protect ourselves from many diseases, such as diphtheria, whooping cough, tetanus, cholera, hepatitis, polio, etc. Today the vaccination drive against polio is very intense. There is an international campaign to eradicate polio from the world just as was the case with small pox. India is one of the few countries where polio is still prevalent due to lack of awareness, sheer negligence and biases. It is important that we spread awareness about the importance of vaccination.

### Methodology

1. Find out the diseases against which vaccination is possible.
2. Interview at least twenty families in your neighbourhood, including domestic helps and people engaged in small trades and services like selling vegetables and food items, tailors, hairdressers to find out:
  - (a) Whether they are aware of the importance of various types of vaccinations.
  - (b) From where they can have it done free of cost.
  - (c) Whether their children are vaccinated. If so, against which diseases.
  - (d) If their children are not vaccinated, why.

### Objectives

- (i) To find out different diseases against which vaccination is done.
- (ii) To make people aware about the importance of vaccination.

## Conclusion

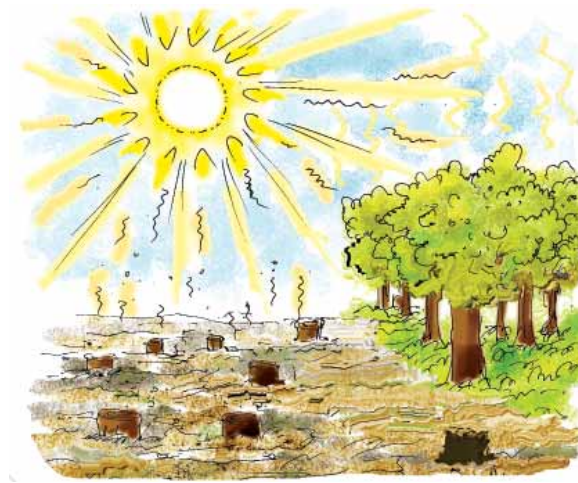
Prepare a report indicating the percentage of people who have not got their children vaccinated.

## Follow-up

Spread awareness about the importance of vaccination in your locality. Encourage people to make sure that their children are vaccinated at the appropriate time with proper follow-up wherever necessary.



## 12. Dangers of deforestation



### Background

Deforestation has been practised by humans since the beginning of civilisation. Fire was the first tool that allowed humans to modify the landscape. The first evidence of deforestation shows up in the Mesolithic period, when it was probably used to drive games (prey animals) into more accessible areas. With the advent of agriculture, fire became the prime tool to clear

land for crops. Agricultural expansion continued to be one of the major causes of depletion of forest resources. Substantial parts of tribal belts, especially in the northeastern and central India have been deforested due to shifting cultivation. Ever since, forests are being cut, for one reason or the other. With the growth of population and ever growing demand for forest products, especially timber and firewood, the forests are fast disappearing. This has led to many environmental problems like floods, soil erosion, climatic changes and destruction of wild life.

### Objectives

- (i) To identify the causes of deforestation.
- (ii) To identify the impact of deforestation.

The destruction of forests is not just an environmental issue. It is strongly correlated with the loss of cultural diversity. Such losses have increasingly marginalised and impoverished many indigenous and other forest dependent communities.

## Methodology

This can be a group project. Each group can be assigned one of the following tasks.

1. Find out how nearby forests have changed during the last 15–20 years. The change may be in the form of area, plantation, land use and loss of wild life.
2. Find out the causes of deforestation.
3. Find out the environmental effects of deforestation, such as increase in atmospheric pollution, soil erosion, drought, flood, etc.

To collect this information the groups may seek help from elders, Panchayat/Municipal records, forest offices, newspaper reports, articles and other records.

## Conclusion

Prepare a report of your findings suggesting measures to control deforestation.



## Follow-up

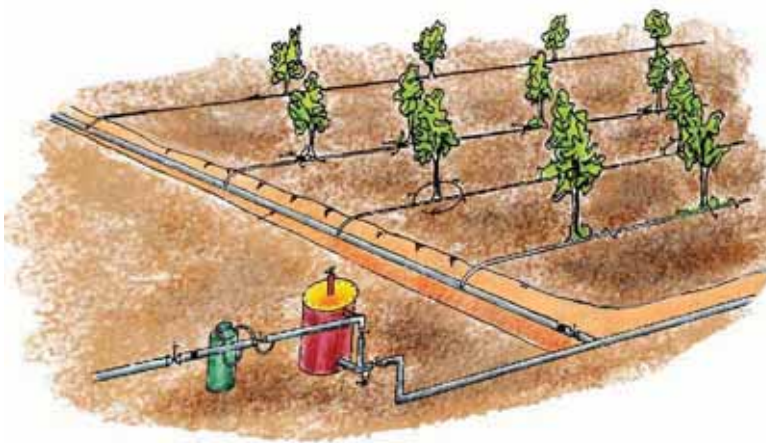
1. Have discussions in the class about the dangers of deforestation.
2. Prepare charts on deforestation and display them on your school bulletin board.
3. Collect information about the green canopy of your region from different sources, including the internet.



## 13. Judicious use of water in irrigation

### Background

Irrigation is the artificial application of water to the soil usually for assisting in growing crops. Irrigation has been around for as long as humans have been cultivating plants, although the means of irrigation have changed. Pouring water from buckets has been replaced by more efficient and mechanised methods. These methods have provided the farmers with easy availability of water as a result of which water is often wasted. Along



with it, over watering is also the cause of soil erosion, excessive displacement of the top soil that affects soil fertility, raising of water table, converting fertile fields into waste land, leaching of nutrients which, in turn, leads to downgraded product quality and reduced yield.

### Objectives

- (i) To be aware of the various means of irrigation, both modern and primitive.
- (ii) To be familiar with the harmful effects of over-watering.



## Methodology

Interview persons of different age groups and find out –

1. The means of irrigation used when he/she was a child of 15 years of age.
2. List the tools used at that time.
3. Are the tools different from the ones used today?
4. Try to see for yourself the tools, methods and techniques being employed for irrigation at present. Draw pictures/ take photographs, if possible.
5. Find out whether the water availability has increased due to the modern means of irrigation.
6. Do the modern means of irrigation have an effect on the environment? Are all the impacts healthy?
7. Has easy availability of water also increased the misuse/ wastage of water?



## Conclusion

Prepare a report on your findings suggesting measures for reducing wastage of water in irrigation.

## Follow-up

Share your observation with other people, including farmers of your area.

## 14. Quality of soil and crop production



### Background

Fertilisers are generally used for healthy growth of plants. But the excessive use of chemical fertilisers makes the soil acidic or alkaline. Plants do not grow well when the soil is either too acidic or too alkaline.

### Objectives

- (i) To realise that excessive use of chemical fertilisers makes the soil acidic or alkaline.
- (ii) To be aware that excessively acidic and alkaline soil affects growth of plants.

### Methodology

1. Visit a nursery or a farm near your residence or school. If it is at a distance, visit with your parents, teachers.
2. Collect information from the supervisor of the nursery or crop field about the factors responsible for the healthy growth of plants and crops.
3. Enquire what are the fertilisers they use and why do they use them.



4. Ask about the quantity of fertilisers used at different stages.
5. Check the pH value of the soil using pH paper.
6. Record the entire information in your notebook.

## Conclusion

Prepare a brief report on the basis of the information that you have collected.

## Follow-up

Try to find out whether it is possible to treat the soil affected by acidity or alkalinity. If so, how?



Around 4.5 trillion cigarette butts or 76, 54, 37, 124 kg of cigarette filter, are littered every year around the world. That means, more than 8, 40, 000 tonnes of litter containing potent carcinogens and poisonous chemicals of which some 1, 52, 000 tonnes will be washed into our waterways.

## 15. Pollution and diseases



### Background

Pollution of different kinds, such as air, water, soil, etc. is increasing day by day all over the world inspite of increasing awareness. The effects of pollution are prominently visible with more and more people suffering from pollution related diseases. It is high time every individual contributes towards controlling pollution at their own level.

### Methodology

1. Identify various sources of pollutants of air, water and soil in your neighbourhood. Select any one of them which is most prevalent in your area.

### Objectives

- (i) To be sensitised about various causes of pollution and the measures to control them.
- (ii) To know about pollution-related diseases.

2. Identify the pollutants and the diseases associated with the type of pollution you have chosen.
3. From records of health department or newspapers, find out how the spread of these diseases has changed during the last 10-15 years.
4. List the rules and laws framed by the government to control pollutants contributed by actions of individuals, and industrial and commercial activities in your neighbourhood.

## Conclusion

Prepare a brief report on your findings.

## Follow-up

Prepare a campaign to educate and sensitise people in your neighbourhood about their responsibilities for controlling pollution.

Incineration of waste releases dioxins, which cause cancer, neurological damage and disrupt the reproductive, thyroid and respiratory systems. Air pollution related diseases killed 72,000 persons across 36 Indian cities in 2005 – a 38% increase from the nineties.

## 16. Pests – Uninvited guests



### Background

Different kinds of pests, such as rats, insects, fungus, etc. attack grains in storage whether at home, in grocery shops, granaries, or godowns. This leads to damage and contamination of the grains thereby reducing the amount of grains available for distribution or consumption.

### Objectives

- (i) To find out the different pests that attack stored grains.
- (ii) To find out measures to control these pests.



## Methodology

1. Visit a godown/granary/silo/*kirana* shop (grocery shop). Observe if some pests are present there.
2. Talk to the authorities and find out which pests attack food grains. List the pests that attack a specific grain.
3. Enquire the approximate monetary loss due to such attacks.
4. Also enquire about the measures that are taken up for the control of different pests and the approximate cost incurred.
5. Record your data.



## Conclusion

Conclude your findings by writing a report using the information that you have obtained.

## Follow-up

Find out the pests that attack the stored grains in your house. Also find out the suitable measures that can be taken to control such attacks.

## 17. Abode of wildlife

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### Background

Wildlife, in the past, has coexisted with other forms of life, such as humans, plants, etc. in its natural habitat in the wild. But with increasing population and various human activities, such as developmental works, hunting, poaching, etc. there has been significant reduction in the number of species as well as their population. So there is a need to protect different types of wildlife in their natural habitat. Some of the measures that have been undertaken include establishment of reserve forests, national parks, wild life sanctuaries, and biosphere reserves.

### Methodology

1. Collect information about national parks, wildlife sanctuaries and bird sanctuaries in your state.
2. Locate them on a state map.
3. Find out the different birds and animals that are found there.
4. Divide them in the category of common, rare, endangered.
5. Collect information about national park, wildlife sanctuary, bird sanctuary and the animals found there from articles, magazines, newspapers and other resource material.
6. Find out the main danger that is threatening the existence of animals even in these reserved areas.

### Objective

To develop understanding about national parks and wildlife sanctuaries and their inhabitants.

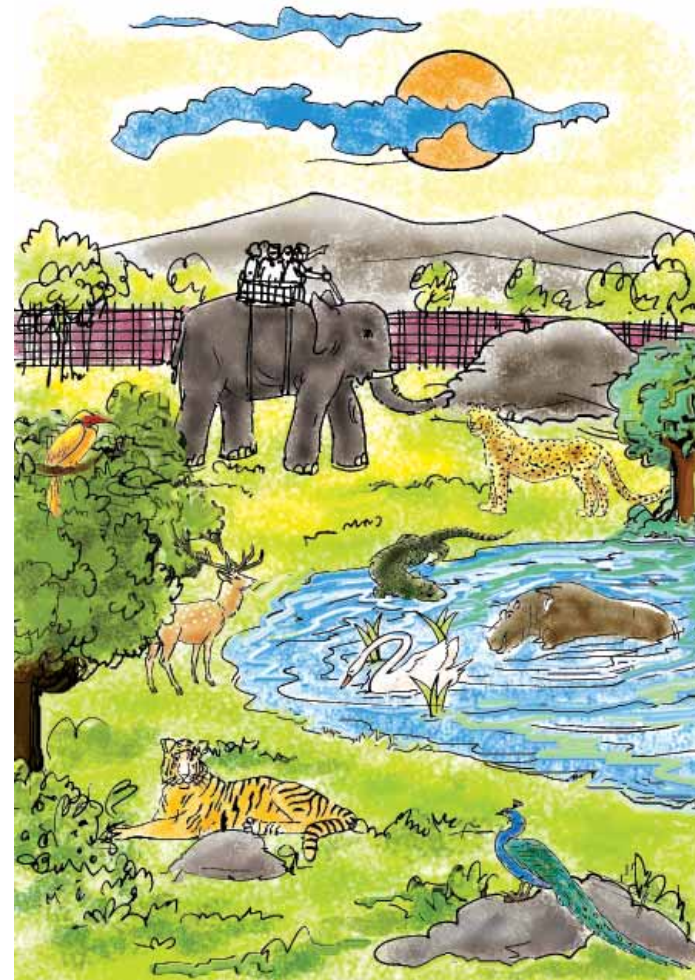


## Conclusion

Based on the information collected by you, prepare a brief report.

## Follow-up

1. Organise discussions in the classroom about national park, wildlife sanctuary and bird sanctuary.
2. Prepare charts about national park, wildlife sanctuary and bird sanctuary and display them on your school bulletin board. Also give interesting facts about the habits and habitats of some animals along with traditional folklore.
3. Organise a quiz on the sounds of different birds and animals (CDs/cassettes are available from the World Wide Fund for Nature and the National Museum of Natural History).





## 18. Monitoring of air pollution



### Background

Most television channels telecast information about different types of air pollutants measured in different cities. Pollution levels vary almost everyday and in different seasons.

### Methodology

1. Note the pollution level for any two cities everyday for one month. You can obtain the information from any TV news channel.
2. Depict the information collected by you graphically.
3. Collect information, if available, about pollution created by major human activities like *mela* (fair), festivals, exhibitions, games and sports meets, etc. Also collect information from newspapers and other sources about weather conditions during the month.

### Objective

To be sensitised about the level of air pollution in cities.

## Conclusion

Try to relate changes in patterns of pollution with human activities and weather conditions.

## Follow-up

Prepare posters/placards towards reducing air pollution and put them up in appropriate places in your colony/locality.



## 19. Hazards of air pollution



### Background

It is often reported that electronic gadgets like televisions, music systems, microwave systems and computers in households located near large open drains, which carry polluted water, have a shorter than expected life of the brand.

### Objective

To investigate the impact of harmful gases on electronic items.

## Methodology

1. Select as many houses as possible near a large open drain and nearly an equal number of houses away from such a neighbourhood.
2. Collect information from both the groups of household about the frequency of repairs required for electronic items like televisions, music systems, DVD players, etc.
3. Contact service stations of some of the electronic items and find out from the mechanics the areas from which they receive a larger number of complaints. Also discuss with them and find out the possible reasons for the number of complaints for repair from certain localities.

## Conclusion

Conclude your study based on the information collected by you.

## Follow-up

Write to the companies manufacturing electronic items to undertake research to improve the quality of their product for safeguard against such conditions.

## 20. Saviours of our environment

### Background

Environmentalism is a concern for the preservation, restoration and improvement of the natural and social environment. It includes conservation of natural resources, prevention of pollution and sustainable use of land. As responsible citizens of the country one must assess all the actions, which will have a direct or indirect impact on the environment. Introspection and laying down

standards for ourselves are also necessary if we wish to have a healthy environment. Youth has the power to influence adults and peers to a great extent.



### Objective

To be acquainted with the work of an environmentalist, or an environment movement, that has an impact on policy decision or course of development.

### Methodology

1. Make a list of five environmentalists working in different areas, regions or parts of the country. Also list five powerful environmental movements.
2. Select either an environmentalist or a movement for your study.

3. Find out the focus of the work of the environmentalists and the environmental movements.
4. Collect the following information about the environmentalist and environmental movements – period, issues, mode of organisation or participation, challenges, executive and judicial interventions, successes, failures and impact.
5. List the contributions they have made towards creating awareness and improving the environment.



## Conclusion

Based on your findings, prepare a report suggesting how students can make a significant contribution in making people aware of environmental concerns. Include the suggestions of your classmates.

## Follow-up

1. Display the information that you have gathered on the school display board.
2. Make arrangement to show documentary films on environment in your school.

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## Notes

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