



HEM *harmonize*

Science
Grade VII

Integration of Values

Teacher's Manual



Teacher Manual for Integration of Values in Teaching Academic subjects

By

HEMA Foundation, Mumbai

Teacher Manual for Integration of Values in Academic subjects

SCIENCE

Grade VII

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Preface



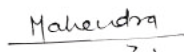
It gives immense pleasure to all of us at HEMA Foundation in presenting the “Teacher Manual for Value Integration” from Grade I to Grade X to our beloved teaching fraternity in school education. Teachers are the corner stones in building the huge edifice for the student community and they are the driving force and guiding spirit to the society. Little will change in the society, if the teachers do



not make any efforts. We are all living in a scenario where value systems need to be integrated and enhanced through essential school subjects so that the students assimilate values into their regular habits effortlessly. There may have been innumerable reasons why values from the society are disappearing, but there cannot be two opinions about the significance of educational institutions in restoring the culture and values of the society. When they say, ‘values are to be caught’, it is leaving a high degree of moral responsibility on the part of our teachers and this manual is our humble effort to lessen that burden for them. This manual is not a substitute to the academic teaching lesson plan, but is a supplementary assistance to the academic text. Nevertheless, the teachers are at perfect liberty to choose and aptly use the learning materials/activities wherever they find it relevant. This manual would be of great use to the teachers as they are written by practicing teachers in the school system and after thorough research and therefore, the general difficulties of teachers such as completion of portions in the given time to teach the subjects etc are taken care of. In fact, some of the lessons have been written after seeing their practical applications in actual classrooms.

We all have a responsibility of creating a society that is driven by values and our younger generation is the key change makers in the society. They all must be inspired by our educational institutions and their teachers so that their intellectual development is supported and augmented by the value systems and culture. HEMA Foundation takes it as a commitment to the society in participating in this huge endeavor. Inviting all the stakeholders to this venture of spreading and integrating values into the learning environment of schools, with all humility, we remain always your well wishers

Thank You,



Mahendra Kabra
Managing Trustee



Anita Maheshwari
Trustee & Creative Director

Acknowledgement

Welcome to HEMA Foundation's "Teacher Manual for Value Integration". I take this opportunity to thank each one of those who participated in it. At the outset I thank the Management of HEMA Foundation, its Managing Trustee Shri Mahendra Kabra, the Trustee and Creative Director, Smt. Anita Maheswari, the Academic Director, for their unstinted support and cooperation in making this happen. Our humble pranams to the Senior most Member of HEMA Foundation Padmashree Shri Rameshwarlal ji Kabra, for his abundant blessings. The Associate Director Hetal Desai, the IT department Head, Shri Arvind Pandey, Shri Akash Shah and all other team mates from HEMA Foundation have contributed immensely toward realizing this manual.

There are several people outside the system who have supported this cause by giving their valuable comments and suggestions and my thanks are due to them as well. My sincere appreciations to the authors of this book who have been esteemed Principals, Section heads and Department heads and educators from reputed institutes of the country and they deserve the highest appreciation in envisaging the concept so well. My sincere appreciation to Dr Shobana Nandakumar Nair, Mrs. Shobha Rajkumar, Mrs. Priya Cibi, Mrs. Sopna T. R and Rashmi Menon, for authoring the manual for Math, EVS, English and Science respectively. It was their untiring work and willingness to modify the documents as and when changes were required or further researches were needed, that this book was made possible.

As the Academic Director of HEMA Foundation and the person who has conceived this idea of value integration, I have gone through this document several times before presenting it to you and am fully aware of the significance of each word used in this document. I am sure the faculty who uses this manual would strictly adhere to the norms of the school Boards and the suggestions given over here. The Central staff of HEMA Foundation is more than willing to take your valuable suggestions and I promise that we shall be able to incorporate them if found suitable in our next publications.

I thank you for all your incredible commitment. All the credits if you find this document useful, would go invariably to all those who wrote the book and those who helped in the realization of the book and all those demerits if any, are purely due to my oversight. Believing that you would find it very useful in reaching out to the students and become inspiring teachers for our younger generations

I remain your sincere



Vijayam Ravi, PhD

Introduction

(must read before the teacher proceeds)

Its 'a Friday evening'. Everyone looks forward to a joyful weekend with family. After a weeklong work, it is a much-needed break. The school campus that was brimming with noises and screams of children, is silent and calm- The evening twilight has set in on the tall buildings, creating beautiful silhouettes. All have shut their tables; cupboards and the office of the school is closed. Principal and staff were slowly proceeding to the gate. They all wished each other a happy weekend. The peon is stepping out. Suddenly it happened. None expected the normal events that take place every day would take a turn so unexpectedly. School watchman came rushing to them to announce that there has been a riot in the city and he said he could see few students along with some other miscreants sabotaging public and private properties and hurting people on streets, hooting and howling. He added that it is not safe now to walk out. That the rioting group included their students as well. The miscreants included some of their old students too. And they were all those 'good' students when they were inside the school campus.

That left the teaching staff and the leaders stunned for a while. For a moment many of them looked at the school building just like that, which is their Almamater, and it stood so tall and elevated with a pride of creating thousands of glorious citizens in the past. Each one had a question mark in their eyes. None spoke. There was a dumb silence. Each one silently started replaying what they have been doing in the classrooms all along. There was an unbelief, inexplicable feeling reflected in their eyes. Did we make any difference to our students today? Did we teach our children to live or did we teach only Math, Science and language?

This is a serious question that all teaching faculty must ask themselves-

Did we teach subjects? Or did we teach children?

Professional standards for teaching academic subjects and transferring the right knowledge to the students have been the main objective of teaching all along, across the universe. All the latest teaching and learning revolutions that are happening in the classrooms and the students are evaluated for their skill development. Education is the vehicle for development of human being. Situations turned out to be grim when the pandemic engulfed the world with its outstretched arms. Every nook and corner of the world reeled under pressure with the pain and uncertainty that was caused by this pandemic. The ambiguity around, the uncertainty, complexity and insecurity around the schools was huge that none could fathom a way to come out of it. Teachers started looking toward blended learning in a hybrid classroom situation as a solution to reach students. All the more a reason for us, to do introspection about what we were doing till yesterday in the classrooms.

Yes, we taught our students Math, English, Languages, Social sciences, Sports, Music, Art and Craft and everything else-but values. We boasted ourselves as the top schools

with more students falling into the distinction list in terms of marks. Every year we sent out to the world, thousands of students with less skills and values but more of academics and marks. We were happy. Schools were happy. But we realize today that only some of those schools have been teaching students and not teaching subjects alone. Teaching subjects has a goal post and that is the academic credentials in terms of marks, but teaching students per say has another purpose altogether and that is -Touching their lives. We were confused and placing our balls in the wrong goal' posts. Result? The riots on the street, misbehavior, calamities, destruction, suicide and a valueless society in the making! Yes, certainly we imparted knowledge of academic subjects, however while this intellectual development is transmitted, there was room for us -the teachers for integration of values into these subjects. Few schools include moral science or value education in the curriculum and the teachers do teach the kids values like an academic subject and most of the schools assess the moral science in a written examination. It is very doubtful whether the students have really gained anything out of this process. Chances are bright that they end up considering the value education as just another subject. Teaching values through books was not a mistake, but assessing the children on marks was the issue. So, students when they completed their moral science examination, and received their 'pass marks', they quietly 'passed on' the values to the dustbins.

They say that the society's growth and degradation depend to a large extent the way the students are produced by the schools. The economic prosperity of a Nation depends to a large extent on living style and value systems of the society and there is every reason to believe that when the crime rate in a country goes high, the economic prosperity has declined in the society. The thinking, the culture of coexistence, working as teams and maintaining the art of tolerance, if these are removed from the society, it is very difficult to revive the Nation. India has been such a rich country with its values and it is a very painful scenario to watch how our younger generation is missing out on values. To a large extent the responsibilities can be passed on to the Macaulay's education system, parents and schools. If the schools make deliberate attempts to impart academic subjects and create excellence in that, the student's generation that gets molded out of the schools would certainly prove to be an asset in creating wealth and prosperity for the nation. However, if the schools do not impart values to the students, the nation will end up in a huge disaster after some time in terms of its moral fibre.. Wealth and success alone do not bring happiness to the society or an individual. Yes, it may bring some kind of satisfaction and one can always get a pleasure out of it. But very soon, this feeling becomes very transient and the mind would look for something else. This is human nature and it happens because the purpose of human life is not imparted to the students in schools. And when the assessment is done, that subject is also done.

Is this the purpose of education? Swami Vivekananda conceives education as the process where the innate potential of the human being is revealed. The innate nature of a human being is peace and joy. The riots on the street shows totally opposite virtues. Then where did the schools go wrong?

The riot on the street by students is not the debate here. It may be right or it may be wrong. The question is of larger dimension. It is of citizenry, safety, security and morality of a Nation, of the Globe! But why does such a behavior happen? Why do our students or our citizens behave in such an unruly manner that is a pain to others? When did our children or our citizens who passed out of the portals of our school, become so very intolerant? What is the fundamental cause for such an unrest in the minds of students, or generally speaking mankind as a whole? The intellectual quotient is very much in place. But when the spiritual quotient and emotional quotient are misplaced, the human beings sometimes behave weirdly. They lose cool, the power to think and act. Most often human beings react.

Did we, at schools, teach our students to act, or react?

Did we, at schools, teach the students values? Or imbue values in them?

Did we teach the students only subjects? Or did we touch their lives?

The Context to Value Integration with subjects:

It is in this context of these questions, that the thought of integrating values with academic subject teaching dawned. Education and values are no two different subjects. They are mutually interwoven. As a teacher, the biggest role is to prepare their students behave like human beings with all values intact. All academic subjects may give them an opportunity to excel in life, but the values learnt help them to live as human being. Since the teacher is an integral part of education and the inspiration in the life of the children, they have to turn toward integrating values while they teach subjects. Value integration does not mean quoting a value and discussing it, rather it is an effort to lead the students to see a personal meaning in whatever the teacher teaches in all subjects. It depends to a large extent on the creativity of the teacher to highlight the value that is hidden in all subjects, including the languages. Value means a person's personal principles or standards of behavior the judgement of how important that value is to him in his life. In nut shell we can say, "Value is a preferential behavior". What the teacher needs to do in class is to help the kids choose 'his/her preferential behaviour'

The fundamental shift that needs to happen here is this.

At the centre, is the value and all subjects are contributing to the stabilization of the value. Therefore, the teaching has to be intertwined with those values from the subjects and the teachers reach to the students in a very subtle way. Each Subject-be it Science, Math Or languages, or social science, or Non-academic subjects, have got something very fundamental to convey to the people who spend time to learn those subjects. And if we look at those subjects from a very objective perspective, we can clearly see what they are all dying to convey to the children. Math talks about precision, value of time, sharing caring, multiplying happiness and joy and several likes. Science talks about hard work and resilience and the will power to fail and still work hard to achieve. Languages give the

feelings of expression, love, compassion and what not. So, when a student goes out of the school portals, he would have assimilated within him values like precision, punctuality, rationality, truth, compassion, love, caring, sharing, determination, courage to fail, spirit of enquiry et etc. Along with similar such values, the content gets learnt by the kids.

What benefits do Value Integration bring to the students?

1. The students acquire several time honoured personal and collective values for life
2. Along with the cognitive development assured by modern education, integrating values in academic subjects prepares the children to develop their social and emotional lives
3. The approach of integration of values in teaching subjects, help the students enrich students' intellectually, physically, socially, morally, spiritually and artistically.
4. Schools can witness more of academic diligence with students showing increased attentiveness in the classroom and show capacity to do independent work
5. The school ambience also will see less of conflicting situations as the students start demonstrating greater empathy and responsibility
6. The student teacher relationships drastically improve and it becomes more trusting
7. Students feel a sense connectivity with others and belongingness

The argument

Teachers are the crucial ingredients in getting the values incorporated into the system and there is no two way about it. At present teachers are focused on completing their lessons on time amid all challenges and they do not have the extra time for doing any research for incorporating the lessons with values. Education and imparting values are no two different subjects. They are one. Additionally, thrusting a subject of value addition always attracts criticisms, primarily from the teaching community since they believe that it is an additional work and have to prepare more.

This argument is in place and cannot be ruled out and that is why HEMA Foundation pitches in for help.

What does HEMA Foundation offer to teachers?

This particular attempt from HEMA Foundation is to address this conflicting issue in education. HF is striving to reach out to teachers with ways and means to incorporate or integrate values while they teach academic subjects so that additional burden is not on them, while they address a major concern of education.

Values can never be taught, values can only be caught

Every subject has material knowledge that is needed for existence. What goes unnoticed more often is the subtle knowledge that the subjects try to convey. Any subject-Language, Math or science-all stand there for spreading virtues and values alongside the material knowledge. It is an integral part of learning the subject.

How and why are the Values Integrated by HF?

There is a very sound reason for HF to adopt the project of Value Integration into academic subjects and it is justified when any one reads the deliberations made in the NEP-2020 -NEP talks passionately about the integration of values, skills, and essential subjects to make the learning holistic. Let us refer to the clause 4.28, and it reads as follows: “Students will be taught at a young age the importance of “doing what's right” and will be given a logical framework for making ethical decisions. In later years, this would then be expanded along themes of cheating, violence, plagiarism, littering, tolerance, equality, empathy, etc., with a view to enabling children to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. As consequences of such basic ethical reasoning, traditional Indian values and all basic human and Constitutional values (such as seva, ahimsa, swachhata, satya, nishkam karma, shanti, sacrifice, tolerance, diversity, pluralism, righteous conduct, gender sensitivity, respect for elders, respect for all people and their inherent capabilities regardless of background, respect for environment, helpfulness, courtesy, patience, forgiveness, empathy, compassion, patriotism, democratic outlook, integrity, responsibility, justice, liberty, equality, and fraternity) will be developed in all students.”

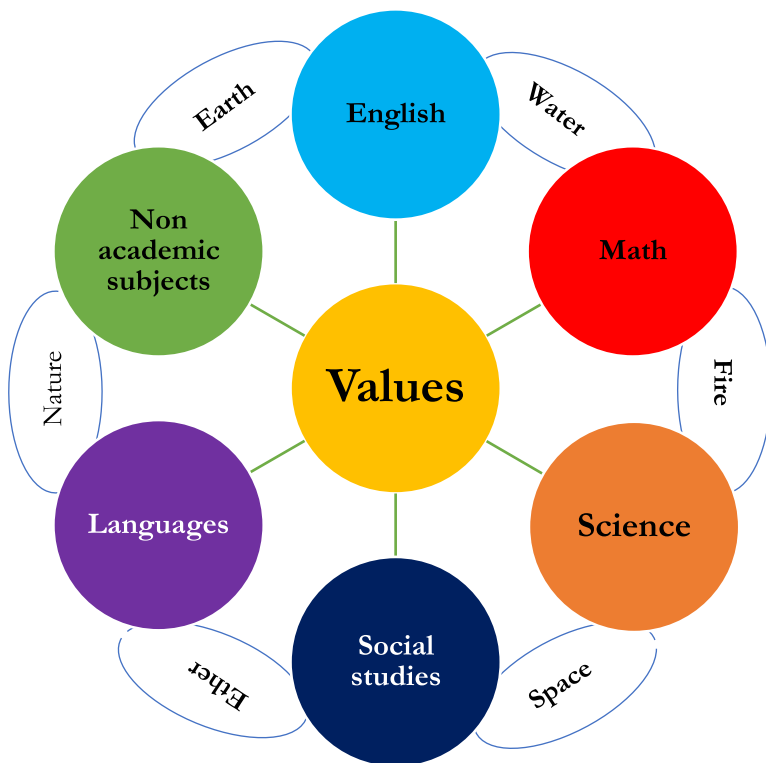
The new NEP and therein the NCERT insist on integration of values with essential subjects. Nature is the mother of all knowledge - Every learning that takes place with human beings is connected through the mind and intellect. While giving food for thought at the intellectual level, teachers have to supplement the emotional aspect through developing the mind. Mind develops by seeing, observations and hearing from sources that make sense to it. Human brain and human mind need to go hand in hand to make rational decisions and emotional attachments. If there are no emotions to any material knowledge learnt, it will remain a subject only. The love for the subject comes, when one extrapolates it to the application of it both at the material and emotional level. The emotional intelligence that gets originated while an academic subject is being taught is as powerful as the academic learning. Because it signals imagination and creativity and these are faculties associated with the mind. The rational brain which is provided with intellectual information about the academic subjects processes the knowledge with the help of the emotional brain-which is the mind. When no food is given to the emotional brain, it gets impoverished. Therefore, a balancing act needs to be done by teachers while imparting knowledge on academic subjects to incorporate the value or virtue that the subject is trying to convey to the reader or learner.

While the teacher teaches a topic ‘Patterns’ in Math, remember that the teacher has to touch the value of precision, discipline and punctuality. The whole universe gives us innumerable patterns and they all follow a certain order. That order brings discipline and it helps you see things in the right perspective. Similarly, the teacher, while discussing about geography, and earth in particular, what can be brought out is the virtue of evolution and the stability given by the earth. Earth is an evolved planet. The innate stability, the order, the growth and silence involved in this process are all virtues that can

be imparted to the students. On similar lines, the ecosystem, the biology, atmosphere, the plants, animals, air, water, aesthetics, and beauty-all talk about values and virtues of truth, tolerance and love, coexistence, interdependence, compassion and honesty.

Integration of values with academic subject teaching is an effort of HEMA Foundation to reach to the teachers with the varied ways of dealing with academic subjects and making it very interesting for the students to learn.

Whom does this manual serve?



The next thing that HF is trying to incorporate is Skills along with values. Skills are also considered to be an integral part of learning and hence while a value is highlighted the skills are also touched upon.

The additional advantage that teachers who use this manual of HF is that, the chart of the flow of lessons can be as such adopted in real teaching sessions without the need for doing a lesson plan again. The pattern of a school lesson plan used for imparting academic session is given incorporating the values integrated in it.

The perfect way of starting an academic lesson in a normal classroom situation so that the students get glued to the teacher's skills of teaching, is assured in the manual

through a context text—either by way of a story or an activity or discussion that rouses the interest of children

The description of the lesson ends with assignments for doing individually, at home or in class and this comes as a huge relief for the teachers

There is also a descriptive summary in the beginning of the text manual where in the topic, the core values, the skills and the activities that can be done and also the materials required for the same are all given so that the teacher gets a quick idea about how to go about the same.

HF, thus, is trying to travel that path of imbibing values to children along with the teachers!

Organization of the manual - How to read the manual?

The teacher will have to read and understand the manual as follows:

This teacher manual follows a certain structure that is not replacing the academic journal of the teacher. On the contrary, serves as an additional support as to how the teacher can link those values that are very relevant for a human life with the teaching of the subjects.

It has two parts:

A descriptive summary: this is a sheet in the beginning of each manual, showing what are the core values, sub values and skills that are linked with the topics and describes what activities can be undertaken to teach the values through subject integration and also shows what all education materials are required. Teacher has to glance through this to get a fair idea about how many values are integrated in total and understand this part first

The second part is the actual manual where the method of integration is dealt with the main academic concept.

The structure of the manual goes as follows: Start reading from introduction

1. **Introduction:** This gives what the lesson is about and what values, skills can be integrated here and the significance of it
2. **Learning objectives:** This plan talks about what are the academic and value driven objectives of learning the lesson
3. **Process and Action:** Here the way how the lesson has to be undertaken and it is shown in the form of a flow chart for quick understanding mentioning the activities at each stage. It starts with the context which actually serves as the introduction of the class to the new topic.
4. **Activities and related discussion:** Here the activities are dealt with in detail with discussion questions that lead to both academic and value driven integration. It is through these the teacher is able to deliver the total lesson effortlessly.
5. **Assignments:** Gives assignments that can be done individually, at home, or as group in the class.

The activities given can be chosen by the teacher as and when needed or as per the time available. It is not mandatory that the teacher does all activities.

Conclusion:

It is a proven fact that any particular value learnt becomes a habit when one practices it consistently. The purpose of integration of values with academic subjects is to learn the values along with the academic concepts and so whenever the academic concepts are tested, the value learnt is reiterated. The creativity and imagination of teacher make the lessons interesting to the students and HEMA Foundation presents this Value Integration Teacher Manual for the benefit of the teaching and student community.

Jai Hind

Conceived and presented by

Academic Director

HEMA Foundation

"वसुधैव कुटुंबकम्"

Vasudhaiva Kutumbakam ("vasudha", the earth; "iva", is ; and "kutumbakam", family). This Sanskrit phrase literally translates to mean that the whole world is one single family. The Sages have said that the entire world is truly just one family connected with thoughts, emotions, humanity and humility.



सर्वे भवन्तु सुखिनः सर्वे सन्तु निरामया ।
सर्वे भद्राणि पश्यन्तु मा कश्चित् दुःखभाग् भवेत् ॥

May all be prosperous and happy. May all be free from illness.
May all see what is spiritually uplifting. May no one suffer in anyway.
Om peace, peace, peace.



Vision

We aim to cultivate a conscious understanding of human values in individuals in order to help them coexist peacefully and harmoniously.



Mission

Our mission is to awaken the spirit of value based living in all individuals at school, organizational and community levels through well researched and structured programs resulting in a responsible, effective and harmonious existence for all



INDEX

01	<u>Unit 1</u>	Page No.
	Nutrition in Plants	3
02	<u>Unit 2</u>	Page No.
	Nutrition in Animals	11
03	<u>Unit 3</u>	Page No.
	Fibre to Fabric	19
04	<u>Unit 4</u>	Page No.
	Heat	27
05	<u>Unit 5</u>	Page No.
	Acids, Bases and Salts	36

06	<u>Unit 6</u>	Page No.
	Physical and Chemical Changes	45
07	<u>Unit 7</u>	Page No.
	Weather, Climate and Adaptation of Animals to Climate	53
08	<u>Unit 8</u>	Page No.
	Winds, Storms and Cyclones	61
09	<u>Unit 9</u>	Page No.
	Soil	69
10	<u>Unit 10</u>	Page No.
	Respiration in Organisms	77
11	<u>Unit 11</u>	Page No.
	Transportation in Animals and Plants	85
12	<u>Unit 12</u>	Page No.
	Reproduction in Plants	93

13	<u>Unit 13</u>	Page No.
	Motion and Time	100
14	<u>Unit 14</u>	Page No.
	Electric Current and Its Effects	110
15	<u>Unit 15</u>	Page No.
	Light	118
16	<u>Unit 16</u>	Page No.
	Water : A Precious Resource	126
17	<u>Unit 17</u>	Page No.
	Forests: Our Lifeline	134
18	<u>Unit 18</u>	Page No.
	Waste Water Story	142

Topic	Values / Life skills integrated & imbibed	Activities
Nutrition in Plants	<p>Core Values considered: Simplicity, Selflessness and Interdependence</p> <p>Other Sub-Values: Respect and Altruism</p> <p>Life skills: Analytical thinking and comprehension skills.</p>	<ol style="list-style-type: none"> 1) A food chain making activity that will inculcate the values like selflessness, altruism and respect in the minds of the children 2) A leaf collection activity that helps to teach the value of simplicity in life. 3) A video demonstration which makes the children appreciate interdependence among various life forms. 4) Preparing a table listing the nutrients in the soil and its sources. This helps to improve the analytical thinking and comprehension skills.

Materials / Resources needed

- 1) Facilities to show video demo.
- 2) Annexure-A print out.
- 3) NCERT text book class VII.

Description (of the points of discussion)

This chapter elaborates on the different types of nutrition in plants, the importance of photosynthesis and how nutrients are replenished in the soil.

The topics discussed are

- Plants are the only producers of food and hence only source of energy in this world and all organisms depend on them for their energy and oxygen needs. Thus they are a true symbol of selflessness.
- The different modes of nutrition in plants like autotrophic, heterotrophic, saprophytic etc.
- The process of photosynthesis and what all factors are needed for photosynthesis and how the simple components gets transformed into complex food materials.
- How nutrients are recycled in the environment.
- All living beings are interdependent on each other for their existence.
- Plants teach us simplicity. One does not need any costly inputs or many ingredients, to produce a very good output in any venture. You can accomplish any great thing in life while keeping your life simple.

Unit 1**Nutrition in Plants**
Simplicity, Selflessness, Interdependence**I. Introduction**

We know that the ultimate source of energy for every living being on earth is the sun. However, plants do the task of trapping that energy and giving it to everyone. Plants are those selfless donors of nature who not only prepare food but also maintain oxygen balance in the atmosphere. Plants perform the role of your mother, who prepares food for everyone selflessly, without expecting anything in return.

This chapter elaborates on the different types of nutrition in plants, the importance of photosynthesis and how nutrients are replenished in the soil. It also explains the process of photosynthesis and the constituents needed for it. Teacher can throw light upon certain important values that we can learn from plants like adaptability and simplicity. The children can also be made aware of the interdependence of all living beings for survival on this planet.

The core values focused upon are *Simplicity, Selflessness and Interdependence* along with sub values such as *Respect and Altruism*.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals.

- Realise that plants are the only producers of food and hence the only source of energy in this world. All organisms depend on plants for their energy and oxygen needs. Thus they are a true symbol of selflessness.
- Differentiate between different modes of nutrition in plants like autotrophic, heterotrophic, saprophytic etc.
- Know about the process of photosynthesis and what all factors are needed for photosynthesis and how simple components get transformed into complex food materials.
- Understand how nutrients are recycled in the environment.

- Realise that all living beings are interdependent on each other for their existence.
- Appreciate the fact that one does not need any costly inputs or many ingredients, to produce a very good output in any venture. You can accomplish great achievements in life while keeping your life very simple.

III. Process & Action Plan

A good teacher is one who can instill confidence in the minds of his/ her students. The children should feel that there is someone whom they can trust and believe and whom they can confide in.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:
Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a food chain making activity that will inculcate the values like selflessness, altruism and respect in the minds of the children. Refer B.1.

2. This is a leaf collecting activity that helps to teach the value of simplicity in life .
Refer B.2.

3. This is a video demonstration which makes the children appreciate interdependence among various life forms. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a table listing the nutrients in the soil and its sources. This helps to improve the analytical thinking and comprehension skills. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Simplicity, Selflessness and Interdependence* along with sub values such as *Respect and Altruism*..

The unit also provides the scope to develop the following skills in the students *like analytical thinking and comprehension skills*.

IV. Activities & Related Discussion

A. The teacher can introduce the lesson by discussing about the various nutrients we get from our food. He/ She can discuss about the sources of various food items that we eat. It can be explained to children that the food we consume comes from the plants, one way or other. It can be emphasized that the ultimate source of energy is the sun and only plants have the ability to trap this energy and pass it on to all other living beings. It can be highlighted that plants are very important in our ecosystem.

B. Activities:

B.1. Teacher can divide the class into three or four groups and give a print out of Annexure A to each group. Now children can be asked to connect the pictures with proper arrows so that it forms a food chain. They can make any number of chains with different coloured arrows.

After the exercise the teacher can point out that for every food chain the starting point is a plant. This will make the children realise that plants are the only producers of food in this planet and all others depend on them for energy. The children can be taught that plants do a selfless service to all living things by supplying food and oxygen to all. Plants also provide shelter and shade to birds and animals. They give happiness and relieves our stress when they blossom with beautiful flowers. This kind of selflessness and altruism shown by plants will urge children to give respect and love to these silent life givers. Next time when the children see a tree being cut, they will try to prevent that action and educate the people about the importance of plants in our life.

B.2. This is an activity that helps the children to understand the importance of chlorophyll in photosynthesis. Teacher can ask students to collect as many different types of leaves as possible from their neighborhood and stick them to a paper and bring it to the class. The teacher can discuss the following queries with the students.

- What is the colour of most of the leaves?
- What do you think that give the leaves this colour? Is there any similarity in their structure or shape?
- Does photosynthesis happen only in leaves?
- There are some leaves with red and brown colours. Can they do photosynthesis?
- What are the elements required for photosynthesis?
- How does the leaves get the nutrients required for photosynthesis?
- Where are the products of photosynthesis going?

After discussion the students will be able to describe the process of photosynthesis, where it is happening and what are the reactants and products of photosynthesis reaction. Teacher can explain that though photosynthesis is a very complex reaction, only very few inputs are required to prepare very complex products, which is an example for simplicity. Plants need only a limited set of simple components to make very complex compounds like carbohydrates, proteins etc. Children can be told that one does not need any costly inputs or many ingredients, to produce a very good output in any venture. You can accomplish any great achievement in life while keeping your life very simple.

B.3. This is a video demonstration and discussion activity. Teacher can show a video in the class ,on lichens whose link is given below.

<https://www.youtube.com/watch?v=TKOv2XWxoeY>

This video will help the children to understand how a lichen look like and how the algae and fungi have a symbiotic relationship for survival. It can be explained to students that sometimes you need to have a give and take policy, when people may have to mutually depend on each other for survival. Humans also need a symbiotic relationship with other animals. For e.g. we raise cows and they in turn give us milk. Children should realize that this world is mutually dependent on one another and one cannot be isolated from the other. Plants also need animals for dispersal of seeds and pollination. Animals depend on plants for food and oxygen Thus we are connected everywhere and interdependent on each other for our existence on this planet. This knowledge of interdependence will inculcate respect to every being in the students' mind.

V. Assignments

C.1. Home Assignment.

The children can be asked to prepare a table in the format given based on the various nutrients required for plant growth and the source of each nutrients. Children can be asked to visit a nearby plant nursery and collect details of common fertilizers and manure available in the local market. This activity will give the students a practical insight into the

nutrient requirements of plants and also give them an awareness of how to take care of plants. The format for the table is given below.

Sl.No	Name of the nutrient	Importance of the nutrient for plant	Sources
1	Magnesium	Important for the generation of chlorophyll	Soil. Fertilizers like Epsom salt.

This activity also helps to enhance the analytical thinking and comprehension skills of the children.

Resources:

References:

- NCERT Class VII Science Textbook.
- Picture Courtesy : www.teachoo.com

Topic	Values / Life skills integrated & imbibed	Activities
Nutrition in Animals	<p>Core Values considered : Simplicity, Self-esteem and Self-reliance</p> <p>Other Sub-Values: Teamwork, Gratitude, Confidence, Health and hygiene</p> <p>Life skills: Creative and Imaginative writing skills</p>	<ol style="list-style-type: none"> 1) A modelling activity which highlights the importance of leader 2) A food plate making activity that teaches children the importance of simplicity ship skills and team work. 3) A recipe making activity which improves the self-esteem and confidence in children and highlights the importance of self reliance. 4) Home assignment-Write up on the journey of a food item of your choice which helps to improve creative and imaginative writing skills

Materials / Resources needed

- 1) Chart paper and some trash items to make the model, pictures of various food items, tapes or pins.

Description (of the points of discussion)

This chapter gives an overview of how digestion and assimilation happens in human beings.

The topics discussed are

- Plants are the only producers of food and all other animals depend on plants for their food and we should be grateful to them.
- The important parts of human digestive system with its structure and functions. The coordination between these organs symbolises good teamwork.
- The need for good oral hygiene and how to maintain it.
- How digestion happens in grass eating animals and how it is different from human digestive system.
- Simple food cooked at home is the best for the body. Ultimately whatever you eat is going to be broken down into simple basic components. Simplicity is an important virtue.
- Know the basics of cooking so that you don't have to depend on others for your survival and you can become self-reliant. This will also help to improve your self esteem and confidence.

Unit 2**Nutrition in Animals**
Simplicity, Self-esteem and Self-reliance**I. Introduction**

All of us have heard the proverb ‘Health is wealth’. The most important factor that contributes to good health is good food. We know that only plants can prepare food, trapping energy from the sun and that is why they are called producers. All other living things depend on plants for their food. The food we eat has to undergo a process of digestion and assimilation in order for us to utilize the nutrients present in it. This chapter gives an overview of how digestion and assimilation happens in human beings.

While explaining the process of digestion the teacher can explain that simplicity is the key to good health. Whatever be the food we eat it is finally broken down into the simple nutrients which is then absorbed into the body. Another take away from this chapter is the fact that food should not only be healthy but also should be clean and free from harmful chemical substances which can harm the body. To ensure that you are having healthy, hygienic food, it is always better to cook food at home. Children should be told that it is important to know some basic cooking for survival. It can help them to be self-dependent and also improve their self-esteem. While explaining the various parts of digestive system, teacher can talk about the importance of teamwork in accomplishing a task. Digestion is a very complex process that involves numerous tissues and glands who have to work together in a coordinated manner, with each and every cell having its own role. It can also be highlighted that just like food undergoes digestion and nutrients get assimilated into the body, along with egestion of all unwanted substances out of the body, one should do the same with one’s thoughts. The thoughts that run through our mind should be evaluated and the good ones should be retained, while the bad ones should be discarded.

The core values focused upon are *Simplicity, Self-esteem and Self-reliance* along with sub values such as *Teamwork, Gratitude, Confidence, Health and hygiene*.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals.

- Realise that plants are the only producers of food and all other animals depend on plants for their food. We should be grateful to them.
- Describe the important parts of human digestive system with its structure and functions.
- Understand the need for good oral hygiene and how to maintain it.
- Describe how digestion happens in grass eating animals and how it is different from human digestive system.
- Realise that simple food cooked at home is best for the body. Ultimately whatever you eat is going to be broken down into simple basic components.
- Develop an interest in cooking some basic recipes so that you don't have to depend on others for your survival and you can become self-reliant.

III. Process & Action Plan

An effective teacher is one who organizes time and prepare materials in advance of instruction. Time management is an important skill that every good teacher should have.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a modelling activity which highlights the importance of leadership skills and team work.
Refer B.1.

2. This is food plate making activity that teaches children the importance of simplicity..
Refer B.2.

3. This is a recipe making activity which improves the self-esteem and confidence in children and highlights the importance of self reliance. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Write up on the journey of a food item of your choice which helps to improve creative and imaginative writing skills.
Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Simplicity, Self-esteem and Self-reliance* along with sub values such as *Teamwork, Gratitude, Confidence, Health and hygiene*.

The unit also provides the scope to develop the following skills in the students like *creative and imaginative writing skills*.

IV. Activities & Related Discussion

A. The lesson can be started based on a discussion on the various food items we eat and the sources of these food items. Teacher should make the children realize the fact that all living beings depend on green plants for their food. They are the only food producers in the world. Even the carnivores which feed on other animals ultimately depends on the plants for their nutrients. Children can be told that we should be grateful to plants for their selfless service to all living beings that makes life survive on this planet.

B. Activities:

B.1. This is a modelling activity. The children can be divided into three or four groups and can be asked to make a model of human digestive system using trash items (an example of which is shown here) and label the important parts. They can also mention the function of the labeled parts in the model. This will help them understand that each of these organs in our digestive system has its own role to perform and the whole process of digestion, assimilation and egestion is a teamwork.



MODEL OF DIGESTIVE SYSTEM

Teacher can elaborate that in teamwork each person has to do his/her job perfectly for the whole task to be completed successfully. Here in the case of human digestive system the whole process of digestion is controlled by our brain which controls all organs including the digestive glands. Our brain is like a leader who motivates each member of a team to work efficiently to accomplish a task. If it fails at any point for e.g. say nutrient absorption is not happening in the intestine, it will result in malnutrition and total breakdown of our system. Children should be made to understand the importance of leadership skills as well as team work while describing the process of digestion in our body. It is a well-coordinated task which is very essential for a healthy body.

It can also be highlighted that just like food undergoes digestion and nutrients get assimilated into the body and all unwanted substances are egested out of the body one

should do the same with one's thoughts. The thoughts that run through our mind should be evaluated and the good ones should be retained while the bad ones should be discarded.

Picture source: <http://www.arvindguptatoys.com/toys/Humandigestivesystem.html>

Things needed: Chart paper and some trash items to make the model. .

B.2. This is food plate making activity .

"The journey of a thousand pounds begins with a single burger." -Chris O'Brien

Create a large food plate for your class - displayed at the front of the classroom - using different-colored papers for each of the five main categories, which should be labeled as follows: carbohydrates, proteins, fats, vitamins, minerals. Have students cut out pictures of at least one food for each category from magazines or newspapers or print them from the internet. (You can also have students draw their own pictures.) Then divide the class into two groups. Have one group use tape or tacks to place their pictures on the bulletin board in the wrong categories. Then, have the second group move the food pictures into the correct categories(as shown in the picture). Check the second group for accuracy. This can be repeated by reversing the team roles.

This activity helps the children to understand the various nutrients present in the food items. This also helps them to appreciate the fact that whatever be the type of food we eat , it is ultimately converted into five main nutrients which can be absorbed by our body. Children should be made aware that food need not be expensive or delicious, to be nutritious. Fast food and carbonated drinks are only fads and does not contribute any nutrients to our body but in turn will do harm to our body .They are the causes of many diseases like diabetes, obesity, high cholesterol etc. Children can be advised to go for simple foods that are good for our health like fruits and leafy vegetables. Simplicity in what we eat is very important for a fit body. .

Things needed: A chart paper, pictures of various food items, tapes or pins.

Activity idea and picture courtesy: <https://www.hmhco.com/blog/nutrition-activities-elementary-middle-school-students>

B.3. This is a recipe writing activity. Children can be asked to write a simple recipe of their favourite food, including the list of the ingredients and also the nutrients present in it. Teacher can convince the children that they all should know basic cooking for survival. Just like the taste and nutrients in the food one should also ensure hygiene. If you know cooking you can eat healthy and clean food. Knowledge of cooking makes you self-reliant and increases your self-esteem and confidence.

V. Assignments

C.1. Home Assignment:

The teacher can give the children an interesting and funny task of writing about the journey of any food item of their choice, through our digestive system. This can be a written as a funny story which will not only make the children familiar with the digestive system but also improve their creative and imaginative writing skills. The teacher can ask the children to read it out in the class which will make it a very interesting task.

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Fibre To Fabric	<p>Core Values considered: Gratitude, Simplicity ,Self-improvement and Selflessness</p> <p>Other Sub-Values: Hard work, Determination, Diversity, Sharing and Caring</p> <p>Life skills: General awareness and Curiosity.</p>	<ol style="list-style-type: none"> 1) A debating activity which helps to inculcate values like gratitude and selflessness. 2) A chart making activity that teaches values like simplicity, humility, hard work, determination and self-improvement . 3) An essay writing activity on a textile exhibition which makes the children appreciate diversity of our culture.. 4) Home assignment-Map making activity as home assignment that helps to develop a general awareness and curiosity among children

Materials / Resources needed

- 1) A chart paper, pictures of various stages of silkworm, colour pencils. A world map, colour pencils, pictures of fibre yielding animals

Description (of the points of discussion)

This chapter gives a detailed over view of the process of making wool and silk fibres. .

The topics discussed are

- Fabrics that come from animal sources and why one should be grateful to animals for their selfless service.
- Which animals yields fibre and who rears those animals and which parts of animals yield yarn.
- The various processes involved in how wool gets converted into fabric.
- The life cycle of a silkworm and the various processes involved in the making of silk.
- The fact that even the most beautiful silk has a humble origin.
- The importance of self-improvement, hard work and determination can be understood from the lifecycle of a silkworm. It also teaches us the virtue of self improvement.

Unit 3**Fibre to Fabric****Gratitude, Simplicity, Self-improvement and Selflessness****I. Introduction**

Along with food and shelter, clothing is also a basic need of our lives. Clothes protect us from external factors like heat, cold, and rain. We usually wear clothes based on climate, occasions, and also according to the present fashion trends. All these clothes are prepared from fibres. Fibres are of two types, plant and animal fibres. This chapter gives a detailed overview of the process of making wool and silk fibres.

While explaining the origin of fibres like silk and wool the teacher can elaborate on their simple and humble origin. The teacher can also urge the children to be grateful to the animals who give us these fibres and appreciate their selfless service. While studying the life cycle of silkworm, children learn the values of self-improvement and the need to evolve daily. The lifecycle of silkworm teaches us that we should do constant hard work and move ahead without stopping in between to reach our goal. By knowing about the variety of fabrics available in this country children will start appreciating the diversity of our country.

The core values focused upon are Gratitude, Simplicity, Self-improvement and Selflessness along with sub values such as Hard work, Determination, Diversity, Sharing and Caring.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Learn about fabrics that come from animal sources and why one should be grateful to animals for their selfless service.
- Know which animals yield fibre and who rears those animals.
- Learn which parts of animals yield yarn.
- Understand the various processes involved in how wool gets converted into fabric.
- Learn about the life cycle of a silkworm and the various processes involved in the making of silk.

- Appreciate the fact that even the most beautiful silk has a humble origin.
- Realize the importance of self-improvement, hard work and determination from the lifecycle of a silkworm.

III. Process & Action Plan

A teacher should self-reflect on himself / herself to assess and improve own teaching skills. Teaching also requires constant monitoring and improvement, and a teacher should be aware of his / her strengths and weaknesses.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:
Fabric identification activity. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a debating activity which helps to inculcate values like gratitude and selflessness.
Refer B.1.

2. This is a chart making activity that teaches values like simplicity, humility, hard work, determination and self-improvement
Refer B.2.

3. This is an essay writing activity which makes the children appreciate diversity of our culture. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Map making activity as home assignment that helps to develop a general awareness and curiosity among children..
Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Gratitude, Simplicity, Self-improvement* and *Selflessness* along with sub values such as *Hard work, Determination, Diversity, Sharing and Caring*.

The unit also provides the scope to develop the following skills in the students *like general awareness and curiosity*.

IV. Activities & Related Discussion

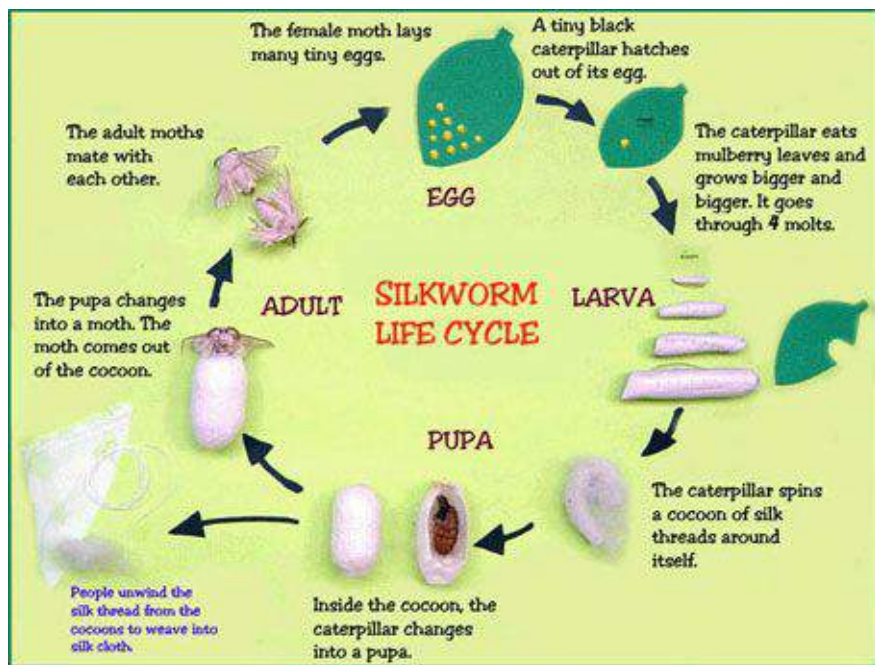
A. The teacher can assess the previous knowledge of the students on different types of fabrics by asking them to identify the various types of cloth materials which he/she can bring to the class. Fabrics made of wool, silk, cotton, jute, rayon, nylon etc. can be shown to the children. They can try to identify these materials and the teacher can demonstrate the differences in the texture and strength of these fibres.

B. Activities:

B.1. This is a debating activity. The children can be divided into two groups and the teacher can conduct a debate on “whether it is justified to keep animals and shearing their wool for our own benefit”. One group should argue for it and other group should argue against it. Children can be given some time to prepare debate points and counter points. Finally, the teacher can reach a general conclusion on the topic, taking the valuable arguments from both sides.

This activity will help the children to understand our dependence on animals for our many daily needs including our clothing needs. Though we have tried substituting natural fibres with man-made ones the comfort that natural fibres give us is unmatched. Even now we prefer natural wool over synthetic one for our winter clothing. Also, natural fabric has less impact on our environment and helps to reduce pollution. In this context the teacher can try to convince students that we should be grateful to animals for providing us with fibres like wool and silk that makes our life more comfortable, and full of variety. In fact, wool is a gift god has given these animals to keep their body warm and protect them from adverse weather conditions. They are sharing these with us and helping us also to survive the harsh cold climate and we should be thankful to them for this great help. We should also learn the virtue of selflessness from these animals and also try to be like them sharing what you have, with others.

B.2. This is a chart making activity. The teacher can ask the children to prepare a chart on the lifecycle of silkworm. They can paste or draw pictures of the different stages and give explanations wherever required. A sample for such a chart is shown here.



Picture courtesy: www.pinterest.com

The teacher can make the children appreciate the fact that even the most beautiful thing like a silk fabric has the humblest beginnings. A simple worm is the origin for such a marvelous fabric. This can be conveyed to children that sometimes the best things in this world have humble beginnings. So, one should not look down upon even the humblest creature. We should appreciate and be grateful to the contribution it makes to the world. Humility is a very noble value which improves your personality and only when you give respect, others will respect you.

Another important value the teacher can highlight is self-improvement. We can see that during its life cycle the silkworm undergoes a number of changes and evolves itself into a fully-grown adult moth. This constant cycle of change and improvisation helps it to move forward through different stages in life and finally reach its goal. In our life also, we have to go through a number of changes and phases, but we should continuously move ahead and improve ourselves to develop into a good human being. Constantly improving oneself through hard work and determination is a key lesson one can learn from the lifecycle of a silkworm.

Things needed: A chart paper, pictures of various stages of silkworm, colour pencils.

B.3. The teacher can ask the children to write an essay on a textile or cloth exhibition they have visited. They can elaborate about the various types of fabrics including the different varieties of silks they have come across in that exhibition. They can even prepare a table containing the names of various types of silk fabric available in India and the regions from where they originate. For eg. Mugha silk from Assam, Kancheepuram silk from Tamil Nadu, Paithani silk from Maharashtra etc. This will also highlight the diversity in our country and the rich resources we have.

V. Assignments

C.1. The children can be asked to prepare a world map showing the various types of animals that yield fibres and the regions where they are found. This will help the children to get familiarized with the geographic presence of fibre yielding animals and the countries which are producing various types of fabric. They can also mark the silk route on the world map and read about how silk travelled from China to Europe. This activity helps to develop a general awareness and curiosity among children.

Things needed: A world map, colour pencils, pictures of fibre yielding animals.

Resources

References:

- NCERT Class VII Science Textbook.
- Picture courtesy: www.pinterest.com

Unit 4

Heat

Topic	Values / Life skills integrated & imbibed	Activities
Heat	<p>Core Values considered : Positivity, Experience and Inner peace</p> <p>Other Sub-Values: Love and Kindness</p> <p>Life skills: Observation and scientific interpretation and deduction skills.</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion which helps to highlight the importance of experience and judgement skills. 2) A demonstration activity which helps the children to relate to values like positivity and inner strength. 3) A demonstration which teaches the importance of true love and kindness. 4) Home assignment-Preparing a writeup which helps to highlight the importance of positivity and inner peace.

Materials / Resources needed

1) Three beakers with water, metal spoon, wooden spoon, plastic spoon, pencil shaves, paper and lens.

Description (of the points of discussion)

This chapter elaborates on the difference between heat and temperature. It also teaches how to measure temperature with a thermometer. It also helps to understand the different modes of heat transfer.

The topics discussed are

- Explain the different modes of heat transfer.
- Differentiate between conductors and insulators.
- How perception deceives and experience helps you to judge things properly.
- Learn from insulators to keep your mental calm and peace and to insulate oneself from negativities
- Like radiation of heat you don't require a medium to convey your feelings of kindness and love. It can be felt by the other person based on your actions.

Unit 4**Heat****Positivity, Experience and Inner peace****I. Introduction**

Heat is a form of energy which can be transferred from one object to another if certain conditions are met. It is a kind of energy which we can easily perceive. It is one of the most useful form of energy that is prevalent outside and inside our body.

This chapter elaborates on the difference between heat and temperature. It also teaches how to measure temperature with a thermometer. It also helps to understand the different modes of heat transfer. In the context of identifying hot and cold bodies teacher can explain what is meant by perception and how our senses can deceive us. He/ She can also touch upon how to keep your mind in a state of calmness just like mixing hot and cold water in order to bring it to a comfortable temperature. The children can also be taught that it is important to insulate one's mind from the negative energy from outside. Another important aspect is to educate the children about how a person can feel the warmth of love and kindness in you without any medium just like heat getting transferred by the process of radiation.

The core values focused upon are Positivity, Experience and Inner peace along with sub values such as Love and Kindness.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Differentiate between heat and temperature and know how temperature is measured.
- Identify the different types of thermometers and their uses.
- Know the conditions of heat movement from one body to another.
- Explain the different modes of heat transfer.
- Differentiate between conductors and insulators.
- Know how perception deceives and experience help you to judge things properly.
- Learn how to keep your mental calm and peace and to insulate oneself from negativities.

- Appreciate the fact that you don't require a medium to convey your feelings of kindness and love. It can be felt by the other person based on your actions.

III. Process & Action Plan

A teacher should always be ready to embrace new technologies and change the teaching strategy whenever needed. This makes learning interesting and contemporary.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:
Demonstration cum Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a demonstration cum discussion which helps to highlight the importance of experience and judgement skills. Refer B.1.

2. This is a demonstration activity which helps the children to relate to values like positivity and inner strength. Refer B.2.

3. This is a demonstration which teaches the importance of true love and kindness. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Preparing a writeup which helps to highlight the importance of positivity and inner peace. Refer C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Positivity, Experience and Inner peace* along with sub values such as *Love and Kindness*.

The unit also provides the scope to develop the following skills in the students like *observation and scientific interpretation and deduction skills*.

IV. Activities & Related Discussion

A. The chapter can start with a context activity which can be demonstrated by the teacher. Light a candle and bring your palm near it. Your body can sense the danger when it gets too close and automatically withdraws your hand away from the candle. Teacher can elaborate that in the same way our experience with people and situations are recorded in our subconscious mind. A bad experience with a person will urge you to avoid any interaction with him / her in future. Experience is one of the greatest assets to our personality. It is always better to keep in mind the experiences when we interact with people. Similarly it is always better to take into consideration the advices of people with more experience than us, when we venture into something new.

B. Activities:

B.1. This is a demonstration cum discussion activity .This is an activity that is given in the textbook.

- Take three beakers and name each as A, B and C.
- Fill the beaker A with hot water, B with cold water and C with a mixture of hot and cold water.
- Now ask one student to dip his / her left hand in A and right hand in B simultaneously for 2 to 3 minutes.
- Then dip both the hands in beaker C. Let the student come out with his / her observations.

After the experiment, the students would have observed that the left hand feels that the water in the beaker C is cold whereas the right hand feels that it is hot. The teacher can now elaborate on perception. We know very well that the water in the beaker is not hot or cold. It is having a medium temperature. But perception is relative in nature and varies from person to person, based on his/ her previous experience. Children can be advised

that one should not be prejudiced based on somebody else's experience about an incident or a person. We should have to rely only on facts based on our own experience. In this demonstration, we can measure the temperature of beaker C with a thermometer to judge whether it is hot or cold. Likewise one should use his own trusted experiences to arrive at a judgement about any one or more event.

Things needed: Three beakers with water.

Note: This demo is given in the NCERT text book which the teacher can refer.

B.2. This is a demonstration which the teacher can do in the class.

- Take some hot water in a beaker Note down its temperature.
- Take some cold water and note down its temperature. Then pour it into the hot water.
- After pouring the cold water wait for 30 seconds and take the temperature of the mixture.
- It can be observed that the temperature of hot water has dropped and the mixture has a temperature that is somewhere in between that of the hot and cold water.

This demonstration clearly conveys that you can bring down the temperature of hot water by mixing cold water to a temperature that is comfortable. This can be related to the fact that you can reduce the ill effects of negativity in your mind by letting in more positive thoughts that will calm down your mind. The children can be asked to develop positivity in their minds in any adverse situation and keep their mind balanced and peaceful. By believing in your inner strength and capabilities one can face any adverse situation and bring it in your favour like what cold water did to the hot water in the demo.

Things needed: Three beakers with water .

B.3. This is activity helps the students to learn about different modes of heat transfer.

- Take some hot water in 3 beakers. Dip a metal spoon in one, a wooden spoon in the second and a plastic spoon in third. Observe which one gets heated more.
- Take some water in a beaker. Put some pencils shaves into it. Now heat the beaker over a burner .Record your observations after the water starts boiling.
- Take a piece of paper and place in the sun .Use a lens to focus the sunlight on to the paper piece. After some time one can observe that the paper piece starts burning.

All three activities helps to demonstrate the three modes of heat transfer conduction, convection and radiation. Teacher can explain in this context that in the case of radiation no medium was required for the heat to flow. This can be correlated to the fact that if you have a mind filled with love and kindness to others which manifests itself by your action's others can realise it. You don't have to express your feelings in words but your deeds will talk loudly for you and your love and kindness will be conveyed to them silently just like heat reaching you from the sun without any medium. Children can be made to realise that

if you have true love and kindness to others , it needs no medium to get conveyed other than your deeds.

Things needed: Three beakers with water, metal spoon, wooden spoon, plastic spoon, pencil shaves, paper and lens.

V. Assignments

C.1. Home Assignment.

The children can be asked to study some of the appliances used at home and list how the principles of heat transfer and insulation are implemented in each of this equipment. For eg. they can write about the thermos flask and how conduction, convection and radiation are prevented in it. Another example is refrigerator. Similarly, handles of cooking vessels, casseroles etc. can be studied. This activity enhances observation and scientific interpretation and deduction skills of the children. The teacher can urge the students to insulate themselves from negativity with a positive mind. It means thinking in an optimistic way, motivating yourself and focusing, thereby making life happier. This helps you to see the brighter side of life and maintain a stable, peaceful mind.

Resources

References:

- NCERT Class VII Science Textbook.

Description (of the points of discussion)

This chapter elaborates on classification of changes into physical and chemical and also on some specific changes happening around us like rusting , evaporation ,crystallization etc.

The topics discussed are

- Differences between physical and chemical changes based on their characteristics.
- Physical changes are reversible and does not result in the formation of new substances.
- Chemical reactions are like inter personal interactions that may have different outcomes like acceptance ,transformation, separation etc.
- Sometimes you may have to be disciplined and self-controlled to protect your integrity, even when you are interacting with different kinds of people with different intentions.
- In life we may have to interact with different kinds of people and sometimes have to work together with them, which will result in both sides getting transformed into something better, like the magnesium reacting with oxygen to form magnesium oxide.
- Rusting can happen to our minds also, which can be prevented with the virtue of positivity and right attitude

Topic	Values / Life skills integrated & imbibed	Activities
Acids, Bases and Salts	<p>Core Values considered: Love, Kindness and Self-control</p> <p>Other Sub-Values: Discipline, Positivity and Love for Nature.</p> <p>Life skills: Observation skills, Judgement and Report writing skills.</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion which helps to improve the observation and judgement skills. 2) An experimental demonstration which helps the children to relate to values like love and kindness 3) A demonstration which teaches the importance of self control, positivity and discipline in life. 4) Home assignment-Preparing a soil test report which helps to enhance the report writing skills of students..

Materials / Resources needed

- 1) 3 beakers, Water, Vinegar, Sodium Hydroxide, Litmus paper, Soil sample, white vinegar, baking soda, soil test report format.
- 2) NCERT text book Class VII

Description (of the points of discussion)

This chapter elaborates on the classification of compounds into acids, bases and salts. This also describes about acidic and basic nature of substances and how to identify them using indicators. This unit also explain neutralization reactions and some of its common daily applications.

The topics discussed are

- How to differentiate between acids, bases and salts based on their characteristics, and using indicators like litmus paper.
- The neutralisation reaction between an acid and a base which results in the formation of salt and water, and some daily life applications of neutralisation reactions.
- Life lessons like the role of kindness and love in neutralizing the negative attitude of people just like a base can remove the acidic nature of substances and convert it into a neutral product like water..
- It is not right to judge anyone based on their external appearance but based on our experiences with them, just like the true nature of acid is not revealed until a litmus test is done.
- Our choice of friends matter in our character building. So one should have enough self-control and discipline, not to fall into bad company.

Unit 5**Acids, Bases and Salts**
Love, Kindness and Self-control**I. Introduction**

Chemistry is the fundamental science of life. There are millions of chemical reactions happening in every living cell that makes life possible. Our body is made up of chemical elements and compounds and each one of them has its own characteristics and properties which makes it distinct from others.

This chapter elaborates on the classification of compounds into acids, bases and salts. This chapter also describes about acidic and basic nature of substances and how to identify them using indicators. This unit also explains neutralization reactions and some of its common daily applications. The teacher can bring to light some life lessons like the role of kindness and love in neutralizing the negative attitude of people just like a base can remove the acidic nature of substances and convert it into a neutral product like water.

The core values focused upon are Love, Kindness and Self-control along with sub values such as Discipline, Positivity and Love for Nature.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals.

- Differentiate between acids, bases and salts based on their characteristics.
- Identify acids, bases and salts using indicators like litmus paper.
- Learn about the neutralisation reaction between an acid and a base which results in the formation of salt and water. .
- Know about some daily life applications of neutralisation reactions.
- Know about the causes and effect of the phenomenon of acid rain and how pollution has contributed to it.
- Realise that just like an acid can be neutralised with a base, with love and kindness, any so called bad person can be transformed into a nice human being.
- Learn how not to judge anyone based on their external appearance but based on our

experiences with them and also how our choice of friends matter in our character building.

III. Process & Action Plan

A good teacher will share his/ her life experiences with children to motivate them. To have so much of experience the teacher must have travelled and worked in other fields. He/ She must be able to answer the question ‘why are we learning this’.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a demonstration cum discussion which helps to improve the observation and judgement skills .
Refer B.1.

2. This is an experimental demonstration which helps the children to relate to values like love and kindness .
Refer B.2.

3. This is a demonstration which teaches the importance of self control, positivity and discipline in life.
Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a soil test report which helps to enhance the report writing skills of students. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Love, Kindness and Self-control* along with sub values such as *Discipline, Positivity and Love for Nature*.

The unit also provides the scope to develop the following skills in the students like *observation, judgement and report writing skills*.

IV. Activities & Related Discussion

A. The lesson can be introduced with a discussion about the nature of various daily used substances like lemon juice, vinegar, baking soda, curd etc. The teacher can explain about the acidic and basic nature of substances and how they differ in their physical characteristics. He/ She can also guide the children on why one should not test the nature of a substance by tasting or touching it and the precautions to be taken in laboratory while handling acids.

B. Activities:

B.1. This is a demonstration cum discussion activity.

- The teacher can keep 3 beakers on a table, one filled with water (beaker 1), another with vinegar (beaker 2) and the third with sodium hydroxide solution (beaker 3). All the three looks colourless and indistinguishable. .
- Now dip a blue litmus paper in the first beaker. There is no change in the colour. Now dip a red litmus paper into it. Again you can observe that there is no change in the colour showing that it is a neutral solution.
- Next dip a blue litmus paper in the beaker 2. It will change to red colour showing that the content of beaker 2 is acidic.
- Now immerse a red litmus paper in the third beaker. It can be observed that it changes to blue colour. This shows that the beaker 3 contains a basic solution.

The teacher can explain to the students that all three liquids look alike, but one is acidic, one neutral and the other basic in nature. Instead of directly touching or tasting an unknown substance which is dangerous, one can use indicators to know the nature of the substances.

With the help of this demo the teacher can make the children understand the fact that one should not judge a person by his / her appearance. It should be based on real

experience after interaction with the person. One should not approach a person with prejudice, and judge him/her based on someone else's experience. It is impossible to predict the behaviour of people in different situations and one should judge others based on his / her actions. Just like the true nature of acid was not revealed until a litmus test was done, the real nature of people can be understood only based on their reactions to life situations. This activity helps to improve the observation and judgement skills of children.

Things needed: 3 beakers, Water, Vinegar, Sodium Hydroxide, Litmus paper.

B.2. This is another interesting demonstration which the teacher can do in the class.

- Take some pure water in a beaker. Demonstrate that it is neutral in nature by dipping a litmus paper into it.
- Add a few drops of vinegar into it. It can be observed that the neutral water changes into acidic. This can be confirmed using the litmus test.
- Add two drops of lime water (calcium hydroxide solution) into the pure water in another beaker. The neutral water turns alkaline, which can be shown by the change in the colour of red litmus paper to blue. .

The teacher can relate the importance of self-control and discipline in life, with the above demonstration. It can be explained that the water which was neutral changed into acidic or basic according to the substance added to it. In the same manner, it is your friendships that make you good or bad. If you are in a good company you also develop good qualities. But if you choose bad friends, you may start developing bad habits. It is always better to avoid bad company, which you can achieve only by self-control and discipline in life. The children can be urged to choose their friends wisely.

Things needed: 3 beakers, Water, Vinegar, Calcium Hydroxide, Litmus paper.

B.3. This is a demonstration of neutralisation reaction. The teacher can cite some practical applications of neutralisation in our daily life like those given below.

- Your mom applying baking soda on ant bites.
- Drinking an antacid when you have acidity in the stomach.
- Brushing the teeth with tooth paste to prevent cavities.

In all the above activities, acids are neutralized with bases to form salt and water. Thus even the vigor of an acid can be calmed down by a base to form the neutral water. The children can be taught about the importance of treating everyone with love and kindness. When you approach others with the right positive attitude they will reciprocate the same. Even the worst hearted person can be transformed into a very nice human being, if one showers love and kindness on him / her. Love and kindness are like soothing base which can neutralize even an acidic heart. Through this activity the children can develop a positive attitude in relationships and guide others also, to positive thinking.

V. Assignments

C.1. Home Assignment.

The children can be asked to prepare a soil test report after testing the soil in their neighbourhood. The process is described below.

Collect 1 cup of soil from your neighbourhood and put 2 spoonful into separate containers. Add 1/2 cup of white vinegar to the soil. If it fizzes, you have alkaline soil, with a pH between 7 and 8. If it doesn't fizz after doing the vinegar test, then add distilled water to the other container until 2 teaspoons of soil are muddy. Add 1/2 cup baking soda. If it fizzes you have acidic soil, most likely with a pH between 5 and 6. If your soil doesn't react at all it is neutral with a pH of 7.

The teacher can guide the children on how to do the testing of the soil. The children can then prepare a soil test report and submit. The class can discuss the advantages of knowing the pH of the soil for supplying the proper nutrients for the soil and thus help the plants to grow healthy. This activity inculcates an interest towards nature and also help the children to apply their theoretical knowledge into practical use in gardening. The children will be able to understand the scientific farming methodologies and the importance of soil testing. This will also give them some training in report writing and also how to interpret a report. A sample report for guidance is given in Annexure A.

Things needed: Soil sample, white vinegar, baking soda, soil test report format.

Resources

References:

- NCERT Class VII Science Textbook.

SOIL INVESTIGATION REPORT

Sampling Date : Sampling Time:
Quantity taken :
Type of Soil Sand/Loamy/Clayey :
Whether Moist or Dry :
Test Method :

Observations:

Conclusion : Nature of the soil Acidic/Basic/Neutral :
Treatment recommended:

Testing Authority

Signature

Topic	Values / Life skills integrated & imbibed	Activities
Physical and Chemical Changes	<p>Core Values considered: Integrity, Adaptability, Teamwork and Positivity</p> <p>Other Sub-Values: Self control, Discipline, and Harmony.</p> <p>Life skills: Cognitive skills and presentation skills..</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion activity that shows the importance of integrity in life . 2) An experimental demonstration which helps the children to realise the importance of teamwork and harmony. 3) A demonstration which teaches the importance of positivity. 4) Home assignment-Preparing a write up on a major change that happened, which helps to improve the cognitive and presentation skills of students.

Materials / Resources needed

- 1) Beaker, salt, water, porcelain crucible, steel plate, magnesium ribbon, burner, sandpaper, watch glass, litmus paper, four test tubes, clean iron nails, corks, oil, anhydrous calcium chloride, paint.
- 2) NCERT text book Class VII

Description (of the points of discussion)

This chapter elaborates on classification of changes into physical and chemical and also on some specific changes happening around us like rusting , evaporation ,crystallization etc.

The topics discussed are

- Differences between physical and chemical changes based on their characteristics.
- Physical changes are reversible and does not result in the formation of new substances.
- Chemical reactions are like inter personal interactions that may have different outcomes like acceptance ,transformation, separation etc.
- Sometimes you may have to be disciplined and self-controlled to protect your integrity, even when you are interacting with different kinds of people with different intentions.
- In life we may have to interact with different kinds of people and sometimes have to work together with them, which will result in both sides getting transformed into something better, like the magnesium reacting with oxygen to form magnesium oxide.
- Rusting can happen to our minds also, which can be prevented with the virtue of positivity and right attitude

Unit 6**Physical and Chemical Changes
Integrity, Adaptability, Teamwork and Positivity****I. Introduction**

Objects around us are always susceptible to change. Some changes are permanent whereas some others are temporary. Changes can be classified into physical and chemical changes according to their characteristics. This chapter elaborates on classification of changes into physical and chemical and also on some specific changes happening around us like rusting, evaporation, crystallization etc.

Teacher can explain that the reactions between different elements and compounds can be compared to inter personal interactions and they may have different outcomes like acceptance, transformation, separation etc. Sometimes you may have to be disciplined and self-controlled to protect your integrity, even when you are interacting with different kinds of people with different intentions. Another interesting point of discussion is that rusting can happen to our minds also, which can be prevented with the help of positivity and right attitude.

The core values focused upon are Integrity, Adaptability, Teamwork and Positivity along with sub values such as Self-control, Discipline, and Harmony.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Differentiate between physical and chemical changes based on their characteristics.
- Realise the fact that chemical changes may be accompanied by colour change, change in smell, evolution of a gas etc.
- Know that physical changes are reversible and does not result in the formation of new substances.
- Understand the process of rusting, crystallisation and burning.
- Realise that chemical reactions are like inter personal interactions that may have different outcomes like acceptance, transformation, separation etc.

- Know that sometimes you may have to be disciplined and self-controlled to protect your integrity, even when you are interacting with different kinds of people with different intentions.
- Realise that in life we may have to interact with different kinds of people and sometimes have to work together with them, which will result in both sides getting transformed into something better, like the magnesium reacting with oxygen to form magnesium oxide.
- Understand that rusting can happen to our minds also, which can be prevented with the virtue of positivity and right attitude.

III. Process & Action Plan

A teacher is great, if he /she can ensure that every student feels that he/she is important. A good teacher will not let down any student and will have similar expectations from each of her students.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a demonstration cum discussion activity that shows the importance of integrity in life
Refer B.1.

2. This is an experimental demonstration which helps the children to realise the importance of teamwork and harmony.
Refer B.2.

3. This is an experimental demonstration which teaches the importance of positivity. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a write up on a major change that happened, which helps to improve the cognitive and presentation skills of students.. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Integrity, Adaptability, Teamwork and Positivity* along with sub values such as *Self-control, Discipline, and Harmony*.

The unit also provides the scope to develop the following skills in the students like *cognitive skills and presentation skills*.

IV. Activities & Related Discussion

A. The teacher can introduce the lesson by asking students to list out some of the change observed in daily life like boiling of water, melting of ice, formation of curd from milk, fermentation of dosa batter, burning of substances, rusting of iron, cooking food etc. Discuss with them the following:

- Which all processes are reversible?
- Has any new substance formed during the reaction?
- Where there any other outcomes like evolution of a gas or colour change etc?

Now the teacher can start explaining to them about the difference between physical and chemical changes citing these examples.

B1. Activities:

B.1. This is a demonstration cum discussion activity. Add some salt to water in a beaker and stir it well. Ask the students whether they think that this is a chemical or a physical change. Ask them to substantiate their answers with reasons. Teacher can ask students to taste the water if they wish. Now heat the contents of the beaker in a porcelain crucible until the whole of water evaporates and can be condensed with the help of a cold steel plate. Now it can be observed that only the salt is remaining in the crucible. The teacher can explain that in this process of solution formation no new substance was formed and each of the components retained its properties. We could easily get the salt back by evaporation since it was a physical change.

After the discussion on the topic of physical changes, it can be conveyed that we should maintain our integrity, retaining our good qualities, even if we have to be in a negative company just like the salt retained its qualities though it was sitting together with water molecules. That is the reason why it could be separated easily. Integrity is a virtue by

which one should remain honest and never lose one's own principles, which is important in life. Even when we have to get along with people who are not following our moral principles, we have to retain our values, so that we can come out easily from the bad company, whenever it is required, just like a physical change which is reversible. We should never sacrifice our values and principles in life, and should be disciplined and self-controlled when it comes to such situations.

Things needed: Beaker, salt, water, porcelain crucible, steel plate.

B.2. This is an experimental demonstration which the teacher can do in the class.

- Take a magnesium ribbon 2 to 3 cm long and clean it with a sand paper to remove any oxide coating on it.
- Hold the ribbon with a tongs above a watch glass and burn it in the air with a burner.
- It can be observed that it burns with a brilliant white light and a white powdery ash like substance is collected over the watch glass.
- If you mix the powder in little water it can be noted that it turns red litmus blue showing that it is alkaline.

Note: This demo is given in the NCERT text book which the teacher can refer. The flame should be observed only with dark coloured goggles.

In this experiment a chemical change is taking place and magnesium and oxygen combine together to form magnesium oxide, a new substance. The teacher can convey to the students that in life we may have to interact with different kinds of people and sometimes have to work together with them, which will result in both sides getting transformed into something better. One can adapt to the group and work as a team in harmony with others, giving better results. It is this adaptation ability that builds good teamwork that can come out with great achievements. Even with your classmates you may have difference of opinion but when you have to work as a team to get a desired result you should keep away your differences and work in harmony.

Things needed: Magnesium ribbon, burner, sandpaper, watch glass, water, litmus paper.

B.3. This is an experiment demonstration to show the various factors needed for rusting and how it can be avoided.

- Take four test-tubes. Place clean iron nails in each test-tube.
- Pour some water in test-tube-1, cork it.
- Pour water (boiled/distilled) in test-tube-2, add some oil and cork it.
- Put some anhydrous calcium chloride in test-tube-3 and cork it.
- Coat the nail in the fourth test tube with paint and let it dry. Then add water to the test tube.

- After 2 to 3 days we can observe that the nails in the test-tube 1 rusted because they were exposed to air and water, while nails in test-tube 2,3 and 4 did not rust..

The teacher can explain that for rusting many factors like moisture, oxygen etc. are needed and rusting can be prevented by giving a coating to the iron surface like that of paint or oil or grease. The teacher can correlate the fact that our minds can also get rusted, if we are not using our thinking power. The negative thoughts can make it degrade like moisture and oxygen causes rusting of the iron nail. The teacher can elaborate that you cannot control the external factors, but you can coat your mind with positive energy and good thoughts that will prevent it from rusting. Positivity is a powerful tool that helps your mind to grow to its full potential and prevent it from degrading.

Things needed: Four test tubes, clean iron nails, corks, water, oil, anhydrous calcium chloride, paint.

V. Assignments

C.1. Home Assignment:

The teacher can ask the children to prepare a write up on a major change that happened in their neighbourhood or in their life and the inspiring way in which they tried to cope up with that change. They can be also be told to highlight the way they overcame the effect of that change and how they successfully turned that event or incident to their side. This activity helps to improve the cognitive and presentation skills of students.

Resources

References:

- NCERT Class VII Science Textbook.

Weather, Climate and Adaptation of Animals to Climate

Topic	Values / Life skills integrated & imbibed	Activities
Weather, Climate and Adaptation of Animals to Climate	<p>Core Values considered: Adaptability, Patience and Self-improvement</p> <p>Other Sub-Values: Flexibility, Courage, Positivity and Hope</p> <p>Life skills: Observation skills, Creative and Imaginative skills and Scientific reasoning skills</p>	<ol style="list-style-type: none"> 1) A weather report presentation activity which helps to inculcate courage and positivity. 2) A demonstration meant to advocate flexibility and adaptability to the children 3) This is a guessing game which highlights the importance of patience in life.. 4) Home assignment - This is a make your creature activity to improve the creative and imaginative skills and scientific reasoning skills of the children.

Materials / Resources needed

- 1) Index cards.(can be made by teacher or by students).
- 2) NCERT' textbook Class VII.

Description (of the points of discussion)

This chapter gives an overview of the difference between weather and climate and also the adaptations of some animals in response to the climatic conditions in their habitat.

The topics discussed are

- Differentiation between weather and climate .
- What causes changes in temperature and humidity.
- How different animals adapt to different types of climate .
- One has to adapt to the changes in life by being flexible and patient.
- One should never lose hope and approach challenges in life with positivity and hope, just like the animals managed to survive in very adverse climates.
- The need for self-improvement in order to adapt to changes .

Unit 7

Weather, Climate and Adaptation of Animals to Climate Adaptability, Patience and Self-improvement

I. Introduction

Weather and climate are related but they differ in the time scales of changes and their predictability. These phenomena influences the flora and fauna of a place. They are the cause of tremendous diversity among world's animals and plants. Animals develop different adaptations over time for the survival of their species. This chapter gives an overview of the difference between weather and climate and also the adaptations of some animals in response to the climatic conditions in their habitat.

Through this chapter the teacher can educate the children that changes are inevitable, but one has to adapt to the changes by being flexible. Some changes are unpredictable and out of our control for e.g. weather, but we can live with those changes by being flexible and tolerant. The whole story of evolution is based on such survival instincts. The teacher can point out that animals and plants survived through the extreme changes in the environment by improving and adapting themselves. Likewise in our life we may face unexpected challenges, but one should never lose hope and approach them with positivity and overcome them. Success comes to those who are not ready to give up.

The core values focused upon are *Adaptability, Patience and Self-improvement* along with sub values such as *Flexibility, Courage, Positivity and Hope*.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Differentiate between weather and climate.
- Know about what causes changes in temperature and humidity.
- Learn how different animals adapt to different types of climate.
- Realise one has to adapt to the changes in life by being flexible and patient.
- Understand that one should never lose hope and approach challenges in life with positivity just like the animals who managed to survive in very adverse climates.
- Realise the need for self-improvement in order to adapt to changes.

III. Process & Action Plan

An effective teacher is the one who is strong in communication, teamwork, time management, problem-solving and organization. They play a critical role in the overall development and success of a student.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a weather report presentation activity which helps to inculcate courage and positivity.
Refer B.1.

2. This is a demonstration meant to advocate flexibility and adaptability to the children.
Refer B.2.

3. This is a guessing game which highlights the importance of patience in life.
Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. This is a make your creature activity to improve the creative and imaginative skills and scientific reasoning skills of the children.. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Adaptability, Tolerance, Courage and Self-improvement* along with sub values such as *Flexibility, Courage, Positivity and Hope*.

The unit also provides the scope to develop the following skills in the students like *observation skills, creative and imaginative skills and scientific reasoning skills*.

IV. Activities & Related Discussion

A. The teacher can start the lesson by asking students whether they have noticed weather reports in the newspaper, television news etc. Discuss with them who is responsible for weather prediction in our country and what are the methodologies used by them to predict the weather. Also discuss about the accuracy level of these predictions and how the students can use these daily reports for their daily preparedness. For e.g. if today's prediction is moderate rainfall, then they should be taking an umbrella with them to the school.

B. Activities:

B.1. This is a weather report presentation activity. The children can be asked to prepare a weather report on their own after going through some sample weather reports in the newspaper and television. Some of the students can be given a chance to present the weather report like those in the television.

In this context the teacher can explain to the students about the unpredictability of weather and same in the case of life. In life one may have to come across unexpected challenges. One has to face them with courage and positivity. Only then one can overcome them and succeed. This also teaches you to be always prepared for the unexpected. For eg. the teacher can ask the students if you are caught up in an unexpected rain, what you will do. The teacher can listen to the responses of the students and discuss the possible solutions. This activity will also help to improve their presentation and observation skills of the students.

B.2. B.2. This is an activity that demonstrate adaptation technique. The teacher can ask the students to tie their right-hand thumb on to their index finger tightly with a tape or thread. Now ask them to try writing with that hand. Children will find it difficult to write with such an arrangement initially. But later after some practice they will manage to write.

This activity helps the children to know how easy it is to adapt to the adverse changes. One should be flexible to undergo changes and also do constant self-improvement to overcome difficult situations. Children should be advised never to lose hope and face life with positivity on their way to success.

B.3. This is a guessing game. The teacher can prepare some index cards (sample shown here) with some descriptions of animals and their adaptations. Children can be divided into 2 teams. Teacher can share one index card with one team and ask their leader to give clues about the animals from the card to the other team, one clue at a time and the other team has to guess the animal name. If not successful every time a new clue should be given until the other team guesses the animal name. This can be repeated by reversing the team roles. The teacher can then discuss the adaptations of each animal in detail.

This activity will not only familiarize the children with the various types of adaptations in animals but also improve their imaginative and comprehension skills. Through this activity the teacher can explain that all these adaptations did not happen in one day. It took thousands of years for the animals to evolve into the new form. This tells the importance of patience in life. It may take some time to adapt to the new circumstances, but one must be patient enough to accomplish it.

Things needed: Index cards. (can be made by teacher or by students).

Index card - 1

Adaptations:

- Clues:**
1. Have webbed feet for powerful swimming.
 2. Their wings, shaped like flippers to help swimming.
 3. They have thick skin and lots of fat (blubber) .
 4. They huddle together with their friends to keep warm.
 5. The dark coloured feathers on back surface help to absorb heat from sun.
 6. They coat their feathers with oil.
 7. Lives in Antarctic region.

Animal name: Penguin.

V. Assignments

C.1. This is a home assignment. Children can choose a particular habitat or climatic region and imagine an animal with many adaptations to suit that particular habitat. They can present that imaginary creature in the class (can even give a name, if required) and

explain all of its adaptations to survive in that particular habitat. If the student is good in drawing, he/ she can also draw or cut and paste the different parts, to form a picture of that creature and present it in the class. This will be an interesting activity which helps to improve the creative and imaginative skills and scientific reasoning skills of the children.

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Winds, Storms and Cyclones	<p>Core Values considered: Flexibility, Inner strength and peace , Cultural values and Unity</p> <p>Other Sub-Values: Humility, Responsibility, Positivity and Kindness</p> <p>Life skills: Writing and presentation skills</p>	<ol style="list-style-type: none"> 1) A video demonstration which helps to inculcate values of positivity and feeling of unity in the children. 2) A video demonstration which helps the children to relate to values like flexibility, humility and positivity. 3) This is an experimental demonstration to show the importance of inner strength in life. 4) Home assignment - Preparing writeup that helps to improve the social responsibility of the children and also their writing skills.

Materials / Resources needed

- 1) Soft drink can, burner and cold water.
- 2) Visual Aids to show a video demonstration.
- 3) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter throws light upon the basic scientific aspect of how the natural phenomena occur and how to predict their occurrence and intensity so that less damage is done by them.

The topics discussed are

- The properties of air, air pressure and its effects.
- How cyclones, thunderstorms and hurricanes are caused and their devastating effect on life .
- Earth gets heated up unevenly which results in pressure belts which causes winds, cyclones and rains.
- Life lessons from air pressure like resilience and inner strength.
- How wind and cyclone teaches us about flexibility, humility and positivity.
- During the event of a disaster like cyclone, we human beings forget our differences and reach out to help each other and learn the importance of unity.

Unit 8**Winds, Storms and Cyclones****Flexibility, Inner strength and peace, Cultural values and Unity****I. Introduction**

We have often heard about natural disasters happening in different parts of the world. These include cyclones, hurricanes, thunderstorms, tsunami etc. They cause immense damage to human lives and property. It is necessary to study the causes of these phenomena in order to foresee them and take necessary action to minimize the damages caused by them.

This chapter throws light upon the basic scientific aspects of how these natural phenomena occur, how to predict their occurrence and intensity so that damages caused by them are minimized. The teacher can make the children aware that all these phenomena are outcomes of uneven heating of earth's surface which create air pressure belts thereby leading to swift movement of air from one place to another. While teaching this topic, the teacher can explain that wind and storms teach you to be adaptable to adverse circumstances and at the same time the need for having strong foundations.

The core values focused upon are Flexibility, Inner strength and peace, Cultural values and Unity along with sub values such as Humility, Responsibility, Positivity and Kindness.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Understand the properties of air, air pressure and its effects.
- Realise that winds are caused by movement of air due to pressure difference.
- Realise that air pressure decreases with increase in speed of air.
- Explain how cyclones, thunderstorms and hurricanes are caused and their devastating effect on life.
- Know that earth gets heated up unevenly which results in creation of pressure belts which causes winds, cyclones and rains.
- Learn many life lessons from air pressure like resilience and inner strength.

- Realise how wind and cyclone teaches us about flexibility, humility and positivity.
- Understand that during the event of a disaster like cyclone, we human beings forget our differences and reach out to help each other and learn the importance of unity.

III. Process & Action Plan

A good teacher should be a good mentor. Mentoring is a natural role taken by teachers, whether it is intentional or not. This again can have positive or negative effects on children. Mentoring is a way a teacher encourages students to strive to be the best they can. This also includes encouraging students to enjoy learning.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a video demonstration which helps to inculcate values of positivity and feeling of unity in children Refer B.1.

2. This is video demonstration which helps the children to relate to values like flexibility, humility and positivity Refer B.2.

3. This is an experimental demonstration to show the importance of inner strength in life. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a writeup that helps to improve writing skills as well as the social responsibility of children. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Flexibility, Inner strength and peace, Cultural values and Unity* along with sub values such as *Humility, Responsibility, Positivity and Kindness..*

The unit also provides the scope to develop the following skills in the students like *writing and presentation skills*.

IV. Activities & Related Discussion

A. The teacher can introduce the lesson by asking some questions on wind and air. The teacher can discuss on how children feel ,when the wind is a cool breeze and when it gets stronger. One experience is pleasant while the other terrifies you. As the movement of air gathers speed and strength, it creates destruction. But the most interesting aspect about cyclone is that there is extreme calmness in the centre of the cyclone which is known as the eye of the storm. This inspires us to maintain our inner calm though things seems to be very turbulent outside. This calmness increases our mental strength and helps us to overcome difficulties in life.

B. Activities:

B.1. The teacher can explain the damages caused by cyclones and storms to human lives and property by showing this video.

https://www.youtube.com/watch?v=WXQYrsi_jns

This video demonstrates the might of nature and how small we are, compared to the power of nature. It should bring a sense of humility and at the same time positivity in the mind of children. They should realise that no storm will last forever. Bad times will always pass, followed by a brighter day.

The teacher can also highlight the fact that during the times of disaster, people come together forgetting their differences and help each other to survive. This is the time when we all have to unite and work together, showing kindness to all others including birds and animals.

B.2. B.2.The teacher can show a video that shows the fury of the recent cyclone that hit the state of Maharashtra in India.

<https://www.youtube.com/watch?v=jPwr7Jhx8b8>

This video demonstrates how a cyclone is capable of destroying anything on its path, including buildings ,trees, electric posts etc.

“When a storm strikes all big trees get uprooted, simple grass always survive”

The teacher can point out two important aspects that will help one to overcome any big disaster in life. The winds are capable of uprooting trees but not the simple grass. Those trees which have strong deep roots and ready to bend are less harmed than those which are having superficial roots and are inflexible. The children can be encouraged not to forget their roots, their cultural values, tradition and family that make them strong to face any storm in life. They should also be told that flexibility is an important virtue that helps one to tide over any difficult situation. Sometimes one may have to bow a little, but it will help him / her to overcome difficulties. Thus it is clear that virtues like simplicity, humility and flexibility makes one powerful and stable.

B.3. This is an experimental demonstration to show that atmospheric pressure exists. Take a small can (a soft drink tin can is enough) and fill half of it with water. Now heat it over a flame and close it. Then pour some cold water on top of it. The teacher can discuss the following points based on the observation.

- What did you observe?
- Why did that happen?
- Who exerted the force from outside to crumble the can?

After the discussion children would have understood what atmospheric pressure means and how it has manifested itself in various cases.

The following video also can be shown to the children for the purpose of better understanding.

<https://www.youtube.com/watch?v=Grziaq-caVE>

Teacher can highlight an interesting aspect here. We are not able to see air. But we can feel it when wind blows. We are having an air column over us which is exerting pressure on us, but we are unaware of that pressure. The take away from these is that, we may have to undergo tremendous pressure from unseen or unknown forces in life. But if we have lot of inner strength we would not be crumbling under the external pressure. It is always important to know that we have to develop resilience (Resilience means knowing how to cope in spite of setbacks, or barriers, or limited resources) by increasing our mental power so that we can handle any external pressure in life.

Things needed: Soft drink can, burner and cold water.

V. Assignments

C.1. Home Assignment:

The children can be asked to prepare a write-up on a recent cyclonic disaster that happened in our country and the extent of damage it caused. They can be asked to list down what all things they can do to help those who are affected by the cyclone. This will inculcate a sense of responsibility in the children and also help to nurture kindness in them. This activity also helps to improve the social responsibility of the children and also their writing skills.

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Soil	<p>Core Values considered: Selflessness, Humility and Self control</p> <p>Other Sub-Values: Gratitude, Creativity, Compassion and Kindness</p> <p>Life skills: Observation skills and curiosity and scientific approach.</p>	<ol style="list-style-type: none"> 1) A sample collection cum discussion which helps to show importance of selflessness and humility . 2) A video demo which helps the children to understand the importance of nurturing social relationships. 3) This is path game which teaches the importance of self control. 4) Home assignment-Soil profiling activity which improves observation skills and curiosity and teaches scientific approach.

Materials / Resources needed

- 1) Soil samples, chart paper and colour pens, digging tools.
- 2) Visual Aids to show a video demonstration.
- 3) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter gives an insight into the various types of soil and the different layers of soil. It also explains what percolation rate of water is and why is it important.

The topics discussed are

- Soil profiling and the different layers of soil.
- Different types of soil and the term percolation rate and how it is calculated.
- Water holding capacity of the soil and how different crops require different types of soils.
- The importance of values like selflessness and humility which we can learn from soil.
- Support others with kindness and compassion so as to help them grow and succeed like the soil helping seeds to grow..
- Nurture relationships and occasionally give some time and effort to make it grow just like plants grow in the soil..
- Sometimes we have to let go unnecessary thoughts and opinions and retain only what is needed like the soil retaining only required water.

Unit 09**Soil****Selflessness, Humility and Self control****I. Introduction**

Soil plays a vital role in earth's ecosystem and sustenance of life on earth.. It is a medium that supplies nutrients to plants, absorbs all the organic matter and keeps the ecosystems functioning. It also provides anchorage to plants, holds water and also gives shelter to many animals. This chapter gives an insight into the various types of soils and their different layers. It also explains what percolation rate of water is and why is it important.

Through this chapter the teacher can explain the importance of selflessness. Just like the soil does a selfless act of nurturing everything that depends on it by providing all the essential things to them, one should be ready to think about others and their needs. We should develop a mindset filled with kindness and compassion and help others to survive. The soil gives support to the plants by giving an anchorage thus helping them to grow taller. We know that behind success of every person there may be many others who, like the soil, support them to achieve it. When the teacher discusses about the role of earthworms he/ she can highlight upon the virtue of humility. Similarly, children can be taught about the importance of nurturing friendships by giving some time to them just like giving infertile soil a new life, by adding nutrients to it.

The core values focused upon are Selflessness, Humility and Self-control along with sub values such as Gratitude, Creativity, Compassion and Kindness.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals:

- Realise the importance of soil in our ecosystem.
- Know about soil profiling and the different layers of soil.
- Identify different types of soil and understand the term percolation rate and how it is calculated.
- Learn about the water holding capacity of the soil and how different crops require different types of soils.

- Understand the importance of values like selflessness and humility.
- Learn to support others with kindness and compassion so as to help them grow and succeed.
- Learn to nurture relationships and occasionally give some time and effort to make it grow.
- Realise that sometimes we have to let go unnecessary thoughts and opinions and retain only what is needed .

III. Process & Action Plan

Teachers have the role of protectors and the students look upon them as their saviors who listens to their problems and help them to solve them. Teachers can easily notice the behavioral changes in children and can take remedial actions immediately.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a sample collection cum discussion which helps to show importance of selflessness and humility .
Refer B.1.

2. This is a video demo which helps children to understand the importance of nurturing social relationships .Refer B.2.

3.This is a path game which teaches the importance of self control in life.
Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Soil profiling activity which improves observation skills and curiosity and teaches scientific approach. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Selflessness, Humility and Self-control* along with sub values such as *Gratitude, Creativity, Compassion and Kindness*.

The unit also provides the scope to develop the following skills in the students like *observation skills and curiosity and scientific approach*.

IV. Activities & Related Discussion

A. The teacher can introduce the lesson by explaining the importance of soil for plant life and in turn for the survival of every creature. Teacher can also highlight the importance of fertile soil and how soil fertility is lost by our irresponsible actions. It can also be pointed out that how non-biodegradable wastes like plastic can contaminate soil and render it useless for the growth of plants.

B. Activities:

B.1. The teacher can ask the student to collect different soil samples from their neighbourhood and note down the following.

- The colour of the soil.
- The type of plants rooted in that soil.
- The types of animals found in that soil.
- Whether earth worms were found in that soil.

The teacher can explain how soil helps the plants to grow by supplying water, nutrients and anchorage. It can be emphasized that soil does a selfless act of helping others to survive without expecting anything in return. The children can be made to understand the importance of being kind and compassionate to others and support fellow human beings to survive and succeed. It should also be reminded that one should not forget one's roots and should be grateful to all those who have given you support to achieve success. Teacher can also make the children aware of the importance of humility by citing the example of earthworm. Even though being a silent small creature, it plays a great role in improving soil fertility and aeration thus helping farmers to get good crop yield.

Things needed: Soil samples.

B.2. The teacher can show a video link given below to explain how humus is formed and how it is getting depleted

<https://www.youtube.com/watch?v=moexid5puSI>

This will help the students to understand their role in increasing soil fertility and thus assist our nature to sustain.

In this context the teacher can mention that only fertile soil supports agriculture. Soil loses its fertility by overuse as well as underuse. This can be compared to our relationships. Our relationships also get worn out as time passes, if we depend more on it as well as if we ignore it. Just like soil needs to be fed fertiliser occasionally, we should give some time in between, to revive and nurture our relationships including friendships. Only then you can expect healthy outcomes from them, like the healthy plants that grow only in fertile soil. This analogy will throw light upon the importance of maintaining social relationships and the need to dedicate some time for reviving them.

B.3. This is a path game for the students to understand the water holding capacity of different types of soil.

- Divide the class into four groups. Assign each group one of the following titles: water, sand, silt, and clay. Explain to students that there are three soil particle sizes; sand is the largest, followed by silt, and the smallest is clay.
- Soil particles should position their arms like the examples in the figure.
- Group the sand particles together so that each particle is touching another (fingertip to fingertip). Now tell students in the water group to try and run through the sand group (under their arms). They should be able to run through with little difficulty.
- Repeat the above step for silt and clay. Silt particles should be touching elbows, and clay particles should be touching shoulders. Discuss the results.
- Mix up the sand, silt and clay particles (students) to make a loam. Ask the water group to run through.

Then discuss the following questions:

- In the path game which group did the water have more difficulty running through?
- Which types of soils hold more moisture?
- Why is it important to know how water percolates through the soil? Who can use that information?

This game helps the kids to understand the scientific aspect of permeability of water in soil. It also teaches them that in life you may have to come across many thoughts and opinions from the outside world. But you should only accept those which are good for you. One should not retain what is not necessary for you and let them go off. We should be capable of discarding what is not needed and retaining only the ones which are good

for your development. This can be achieved through self-control. One should train the mind in such a way that it should be able to discard unnecessary stuff like conflicting opinions and thoughts. A fertile soil with proper water content only can help plants grow, just like a clear mind only can nurture creativity.

V. Assignments

C.1. Assignment.

The teacher can take the students outside the classroom into a garden or bare land and ask them to dig the soil and collect samples of soil from different depths. This activity can be done in small groups and each group can prepare a soil profile chart and present it in the class. This exercise will help to enhance the observation skills and curiosity of the students. They will also develop a scientific approach to the topic under discussion.

Things needed: Soil samples, chart paper and colour pens, digging tools.

Resources

References:

- NCERT Class VII Science Textbook.
- B-3 Activity idea courtesy: Agriculture in the Classroom, Utah State University.

Topic	Values / Life skills integrated & imbibed	Activities
Respiration in Organisms	<p>Core Values considered: Mindfulness, Confidence, Positivity and Unity</p> <p>Other Sub-Values: Concentration, Oneness and Adaptability.</p> <p>Life skills: Visualization and interpretation skills..</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion which helps to inculcate confidence and mindfulness. 2) A chart making activity which helps to understand adaptability and flexibility. 3) This is a demonstration cum discussion activity which teaches the importance of positive thoughts that will give immense power to the mind. 4) Home assignment-Assignment on preparing a model which helps to enhance the visualization and interpretation skills..

Materials / Resources needed

- 1) A chart paper, colour pencils, a beaker with lime water and a straw.
- 2) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter gives an overview of different types of respiration ,the different organs that help this process of gaseous exchange and how it happens in some organisms other than humans.

The topics discussed are

- The difference between breathing and respiration..
- The different types of respiration and their products and by products.
- The structure and function of various parts of human respiratory system including trachea, bronchi ,lungs etc.
- How other organisms like cockroach, fish and plants respire.
- The importance of lung health and practice the various methods to improve it like breathing exercises, pranayama etc.
- Why it is important to discard all toxic substances in our body and apply the same logic to negative thoughts in our mind.
- How we all are connected with one another through the air we breathe giving us a feeling of oneness.

Unit 10**Respiration in Organisms**
Mindfulness, Confidence, Positivity and Unity**I. Introduction**

Respiration is the process in which food is broken down with release of energy and gases which are exchanged between the cells and its surroundings. It involves various stages including breathing, exchange of oxygen and carbon dioxide and breaking down of glucose inside the cells. The respiratory system is a biological system consisting of specific organs and structures used for gas exchange in animals and plants. The anatomy and physiology that make this happen varies greatly, depending on the size of the organism, the environment in which it lives and its evolutionary history. This chapter gives an overview of different types of respiration, the different organs that help this process of gaseous exchange and how it happens in some organisms other than humans.

Teacher, while elaborating the process of breathing can make the children aware about the importance of good breathing habits. He/ she can also highlight why exercise is needed for efficient breathing and how breathing exercises like pranayama help to improve oxygen intake and increase the lung capacity. Efficient breathing improves concentration and confidence. The fact that all animals breathe the same air that we breathe gives us a sense of unity and oneness. It also tells about why you should discard substances which are toxic to our body, just like carbon dioxide accumulation which can cause death. Likewise, we should not accumulate bad thoughts and negativity in us, which eventually destroys our mental power.

The core values focused upon are Mindfulness, Confidence, Positivity and Unity along with sub values such as Concentration, Oneness and Adaptability.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Identify the difference between breathing and respiration.
- Know about the different types of respiration, their products and by products.
- Describe the structure and function of various parts of human respiratory system including trachea, bronchi, lungs etc.

- Understand how other organisms like cockroach, fish and plants respire.
- Realise the importance of lung health and practice the various methods to improve it like breathing exercises, pranayama etc.
- Understand why it is important to discard all toxic substances in our body and apply the same logic to negative thoughts in our mind.
- Appreciate the feeling of oneness among all living organisms and how we all are connected with one another.

III. Process & Action Plan

Teachers are arguably the most important members of our society. They give children purpose, set them up for success as citizens of our world, and inspire in them a drive to do well and succeed in life.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:
Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a demonstration cum discussion which helps to inculcate confidence and mindfulness. Refer B.1.

2. This is a chart making activity which helps to understand adaptability and flexibility. Refer B.2.

3. This is a demonstration cum discussion activity which teaches the importance of positive thoughts that will give immense power to the mind. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a model which helps to enhance the visualization and interpretation skills. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Mindfulness, Confidence, Positivity and Unity* along with sub values such as *Concentration, Oneness and Adaptability*.

The unit also provides the scope to develop the following skills in the students *like their visualization and interpretation skills*.

IV. Activities & Related Discussion

A. Story narration:

The teacher can start the lesson by initiating a discussion with a simple demonstration. Ask a student to volunteer to skip a rope for 1 minute. Ask the children to observe his breathing and answer the following queries.

- Do you observe any difference in his breathing pattern?
- What is the reason for the change in his breathing speed?
- Ask him to touch and feel the movements in his chest cavity and say what he feels?
- What do you think about his heart rate?

When these questions are answered the children will get an idea on how our breathing speed is linked to the energy requirement of our body. This will also help them to understand the fact that lung health is very crucial for overall health of our body.

B. Activities:

B.1. The children can be asked to observe their breathing for one minute. They can be asked to record the number of inhalations and exhalations made by them. They can be asked to do deep breathing and expand their lungs to full. It can be highlighted that different people have different lung capacity depending on many factors. Teacher can make the students understand the importance of improving our lung capacity to facilitate maximum exchange of gases. They can be urged to do breathing exercises and pranayama and can be told that these will improve their confidence and mindfulness. The children might have already experienced that when they observe their breathing they become mindful and aware of their body. This awareness is very important in developing concentration and good mental health.

The interesting fact that the air we breathe is shared by all organisms can be pointed out. The fact that all of us belong to the same thread and are connected to each other by

the air we breathe will bring about a feeling oneness in the mind of children. Even the humble earthworm is connected with the giant elephant through the thread of life.

B.2. This is a chart making activity. The children can prepare a chart in a tabular form with the names of different animals found in your neighbourhood and their breathing methodology as shown here.

Sl No.	Name of the organism	Type of habitat	Breathing method
1	Crow	Arial	Lungs
2	Fish	Aquatic	Gills
3	Earth worm	Soil	Skin

The children can be asked to include as many number of organisms as possible in the chart. This will trigger their scientific investigation skills and also their curiosity. After the chart is completed the teacher can help the children understand how animals adapt to their environment. Their flexibility and adaptability made them survive over the period of evolution. For eg. take the case of a frog that has adapted itself to breathe both on land and in water. Children should be made aware of the importance of adaptability and flexibility in life. They can be told that sometimes they may have to come across life situations which are different from what they have been used to. Take the case when you are shifting to a hostel from the comfort of your home. You may have to adapt to the new environment and make changes in your lifestyle for your survival.

Things needed: A chart paper, colour pencils.

B.3. This is a demonstration cum discussion activity. Take a beaker containing fresh lime water. Close the beaker with a lid having a small hole in it. Ask the students to blow gently through a straw inserted into the beaker through the hole. You can observe that the lime water turns milky showing the presence of carbon dioxide.

- Why is carbon dioxide present in the air we exhale?
- Which is more in the air we exhale carbon dioxide or oxygen?
- Why should carbon dioxide be expelled from our body?
- What happens if it is retained?

The answers to these questions will give an insight into the fact that all toxic substances should be discarded from our body and cannot be retained as it will cause harm to our body, even death. In this context teacher can also tell the children that one should not retain bad thoughts and negativity in one's mind. They are also toxic to our mind and will deteriorate our mental health. So encourage them to fill their mind with positive thoughts that will give immense power to the mind.

Things needed: A beaker with lime water and a straw.

V. Assignments

C.1. The children can be asked to make a model of human respiratory system using balloons and straws. This will help them to understand the working of diaphragm and chest muscles during inhalation and exhalation. This will help to improve their visualization and interpretation skills.

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Transportation in Animals and Plants	<p>Core Values considered: Consistency, Responsibility and Teamwork</p> <p>Other Sub-Values: as Hard work, Humility, Gratitude, Sharing and Caring</p> <p>Life skills: Imagination and creative skills and innovation skills.</p>	<ol style="list-style-type: none"> 1) A video demonstration cum discussion which conveys the ideas of teamwork and consistency. 2) A video demonstration cum discussion which can inculcate gratitude and humility in children. 3) This is a poster making activity which teaches social responsibility 4) Home assignment-Model making home assignment which improves innovation skills

Materials / Resources needed

- 1) A balsam plant just uprooted, ink solution, A poster paper, poster colours
- 2) NCERT textbook Class VII.
- 3) Visual Aids to show a video demonstration.

Description (of the points of discussion)

This chapter gives a detailed description of the circulatory and excretory system in humans and also about the vascular system in plants..

The topics discussed are

- The functions of blood and its constituents.
- structure and function of blood vessels and heart.
- How the waste materials are removed from our body.
- The structure and function of human excretory system.
- The role of xylem and phloem in transportation of water and minerals and also that of food to and from various parts of the plants.
- The whole system of transportation in our body is a well-coordinated teamwork of many different types of tissues.
- How heart changes its pace according to the requirement of the body and thus helps us to meet our varying energy requirements. Heart can also be considered as a symbol of hard work and consistency.
- The importance of blood donation as a noble act and how you should show your social responsibility by donating your blood.
- Even the tallest tree depends on its roots for its daily supply of water and nutrients. This shows the importance of being humble and remembering the roots

Unit 11**Transportation in Animals and Plants
Consistency, Responsibility and Teamwork****I. Introduction**

All living organisms need to transport materials like food, water, and oxygen to various parts of the body. Food and oxygen are transported to all the cells in the body for growth and respiration. Waste products are transported from the cells to organs that excrete them. Not all of the food we eat can be used by the body, so eventually, some will exit the body as wastes. This chapter gives a detailed description of the circulatory and excretory system in humans and also about the vascular system in plants.

While teaching the structure and function of human heart the teacher can highlight the fact that heart is a symbol of hard work and consistency. It works untiringly throughout our life to keep us alive. Our body's circulatory system is a great example for teamwork where every member works in a well-coordinated manner with a common goal. Children can also be told about the importance of donating blood to help those who are in need for the same. The teacher can convey that it is an act of social responsibility and also a noble act of sharing and caring for others. The teacher can educate the children that one should never forget one's roots, just like even a tall tree has to depend on its root for water and minerals.

The **core values** focused upon are *Consistency, Responsibility and Teamwork* along with sub values such as *Hard work, Humility, Gratitude, Sharing and Caring*.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals. The children will be able to

- Describe the need for transportation in plants and animals.
- Describe the functions of blood and its constituents.
- Explain the structure and function of blood vessels and heart.
- Know how the waste materials are removed from our body.
- Explain the structure and function of human excretory system.
- Know about the role of xylem and phloem in transportation of water and minerals; and also, that of food to and from various parts of the plants.

- Realise that the whole system of transportation in our body is a well-coordinated teamwork of many different types of tissues.
- Understand how heart changes its pace according to the requirement of the body and thus helps us to meet our varying energy requirements. Heart can also be considered as a symbol of hard work and consistency.
- Appreciate the importance of blood donation as a noble act and how you should show your social responsibility by donating your blood.
- Realise that even the tallest tree depends on its roots for its daily supply of water and nutrients. This shows the importance of being humble and remembering the roots.

III. Process & Action Plan

One of the many qualities a teacher should have is compassion. Compassion is important not only when dealing with the students but also other teachers, other school staff, and parents.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:
Demonstration and Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a video demonstration cum discussion which conveys the ideas of teamwork. Refer B.1.

2. This is a video demonstration cum discussion which can inculcate gratitude and humility in children. Refer B.2.

3. This is a poster making activity which teaches social responsibility. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Model making home assignment which improves innovation skills. Refer C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Consistency, Responsibility and Teamwork* along with sub values such as *Hard work, Humility, Gratitude, Sharing and Caring*.

The unit also provides the scope to develop the following skills in the students like *imagination and creative skills and innovation skills*.

IV. Activities & Related Discussion

A. The teacher can start the chapter with an activity related to circulation of blood. Students can listen to their pulse beat in various ways as shown below:

- Put your fingers into the ear to close it so no external noise is heard .Then a muffled rhythmic pulse beat can be heard from inside.
- Keep your finger on the wrist with a little pressure. You can feel the pulse rate.
- Another location you can feel the pulse in under the ear beside the angle of jaw.

The children can be asked to record the pulse rate before doing some exercise like running or jumping and also after doing them. They can understand that there is a difference in pulse rate before and after. The teacher can explain that when we do exercises, we require more energy. For more energy to be released more oxygen has to be supplied. When more oxygen is needed heart starts pumping at a higher pace to supply more blood to the muscles. The pulse that we feel is the rhythmic beating of the heart. The heart is an organ that is a symbol of hard work and consistency. It works hard throughout our lifetime tirelessly to keep us alive. It changes its beating speed in order to match our requirements. In the same way one has to do hard work consistently to achieve one's goal. When challenges come up, one has to gear up to face it, overcome it and move ahead with determination.

B. Activities:

B.1. The teacher can show the Youtube video on circulatory system whose link is given below and explain the structure and functions of various organs in human circulatory system.

<https://youtu.be/ML2WX84gsGE>

In this context the teacher can discuss about the teamwork and coordination displayed by the various organs in achieving the common goal. If any one of the organs

fail then the whole system will break down. In life also one should show team spirit and work with utmost sincerity when you are working in a team. Each member has to contribute his maximum and accomplish the task given to him / her without fail.

B.2. This is a video demonstration on the transportation of materials like water, minerals and food to and from the different parts of the plants.

<https://youtu.be/bvPM6sfidY4>.

The teacher can demonstrate the movement of water and minerals through a simple experiment. Take a balsam plant with roots. Dip the root portion in an ink solution which is coloured. After some time we can observe that the colour is moving upwards through the stem. This shows that water is pulled upwards through the stem from the roots. The teacher can explain about xylem and phloem, the vessels that transport water and minerals upwards and food to all other parts of the plant.

In this context the teacher can tell the children that how tall a tree may be, it has to depend on its roots for getting water and minerals. This will teach children the importance of humility in life. You may be conquering great heights in life, but should never forget your roots, or the people who helped you to reach the epitome of success. Always be humble and show your gratitude to those behind your success.

Things needed: A balsam plant just uprooted, ink solution.

B.3. This is a poster making activity that will make the children aware of their social responsibility. Teacher can explain about blood groups and the importance of blood donation. Children can be asked to make posters for a blood donation camp a sample of which is given here.



They can highlight the importance of blood donation and urge people to donate blood. Children can be educated on their social responsibility and also the need for sharing what you have and caring for fellow human beings. It may take only 15 to 20 minutes of your time to save a life. This activity will also help to improve the imaginative and creative skills of the children.

Things needed: A poster paper, poster colours.

V. Assignments

C.1. Ask the children to make a stethoscope model to measure the heartbeat. This activity

helps to improve the innovative skills of students. Children can refer the NCERT text book for guidance.

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Reproduction in Plants	<p>Core Values considered: Interdependence, Positivity and Perseverance</p> <p>Other Sub-Values: as Love, Kindness, Compassion and Adaptability</p> <p>Life skills: Imagination and creative skills and innovation skills.</p>	<ol style="list-style-type: none"> 1) A discussion which helps to inculcate values like positivity, adaptability and perseverance. 2) A chart making activity which helps to inculcate humility in the minds of the children.. 3) This is a seed germination activity which teaches the importance of patience and hope. 4) Home assignment-Preparing a chart which helps to enhance the observation skills and analytical thinking

Materials / Resources needed

- 1) A chart paper, colour pencils, and different kinds of seeds, Some pea or bean seeds, a small pot with soil.
- 2) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter elaborates on the different methods of asexual reproduction and how sexual reproduction takes place in plants.

The topics discussed are

- The two methods of reproduction in plants with examples.
- The different types of asexual reproduction like budding, fragmentation, vegetative propagation etc.
- The process of sexual reproduction in plants and understand the role of different parts of a flower.
- The various methods of seed dispersal and why it is needed.
- The process of germination is slow and requires patience.
- Even small humble seeds grow into huge trees.
- We will receive only what we give, just like we can get only that fruit whose seed is sown. So always try to give love, compassion and kindness to get back the same from the world.
- Always be in the right company. Only then you can grow to your full potential like a seed sown in a fertile soil.

Unit 12**Reproduction in Plants****Interdependence, Positivity and Perseverance****I. Introduction**

Reproduction is the biological process by which organisms give birth or give rise to a new organism. This process is seen in all living organisms- both plants and animals. There are two types of reproduction -asexual and sexual. This chapter elaborates on the different methods of asexual reproduction and how sexual reproduction takes place in plants.

This chapter helps children to understand and appreciate values like interdependence, patience and positivity. The process of germination is a slow process and requires patience. Though seeds are small, when planted in the right conditions, they grow into tall trees, using their full potential. They are a symbol of humility. Plants are best examples of perseverance. They cannot dictate their environment. But they try to survive adverse conditions with all available strength and positivity, in a consistent manner. They depend on other agents for pollination and dispersal of seeds which is a best example for interdependence. They are ready to adapt to any circumstances and thrive. As the saying goes ‘What you sow is what you get’, we will get back only what we give. Always try to sow the seeds of kindness, compassion and love if you expect the same from the world. If you sow the seed in a fertile soil it will grow healthy., else it will die. Same is the case with human beings. If we are in the right company ,we will grow to our full potential.

The core values focused upon are Interdependence, Positivity and Perseverance along with sub values such as Love, Kindness, Compassion and Adaptability.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Learn about the two methods of reproduction in plants with examples.
- Describe the different types of asexual reproduction like budding, fragmentation, vegetative propagation etc.

- Describe the process of sexual reproduction in plants and understand the role of different parts of a flower.
- Know about the various methods of seed dispersal and why it is needed.
- Realise that the process of germination is slow and requires patience.
- Appreciate the fact that even small humble seeds grow into huge trees.
- Understand that we will receive only what we give, just like we can get only that fruit whose seed is sown. So always try to give love, compassion and kindness to get back the same from the world.
- Remember to be in the right company. Only then you can grow to your full potential like a seed sown in a fertile soil.

III. Process & Action Plan

A good teacher conveys a sense of leadership to students by providing opportunities for each of them to assume leadership roles. Effective teachers focus on shared decision-making and teamwork, as well as on community building.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a discussion which helps to inculcate values like positivity, adaptability and perseverance. Refer B.1.

2. This is a chart making activity which helps to inculcate humility in the minds of the children. Refer B.2.

3. This is a seed germination activity which teaches the importance of patience and hope.. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a chart which helps to enhance the observation skills and analytical thinking. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Interdependence, Positivity and Perseverance* along with sub values such as *Love, Kindness, Compassion and Adaptability*..

The unit also provides the scope to develop the following skills in the students *like observation skills and analytical thinking*.

IV. Activities & Related Discussion

A. The teacher can arrange a nature walk to a nearby garden or park or forest. Ask the children to collect the different types of flowers and seeds available in the garden. (Please seek permission before plucking flowers). The teacher can explain that all the flowers though different in colour, size and shape has one purpose. i.e.; produce seeds by sexual reproduction. The teacher can show the different part of the flowers including their pollen (if needed, one can use a lens). This activity helps to familiarize the students with the different reproductive parts of a flower. It also tells them that these flowers require the help of other agents for pollination. Here one can observe an interdependence between different entities in this world.

B. Activities:

B.1. The teacher can initiate a discussion by citing instances where we can see small banyan trees growing inside the cracks of concrete walls and pipes as shown in the picture.

The teacher can ask some questions as given below:



- How do you think the banyan seed has reached there?
- How can it get the essential nutrients required for its growth?
- Can you call it an adaptation?
- Is it harmful to the wall? If yes, Why?
- What can you learn from this tree?

Picture courtesy: www.dreamstime.com.

The teacher can point out that plants cannot dictate their environment. But they try to survive in most adverse conditions with all available strength and positivity, in a

consistent manner. They are ready to adapt to any circumstances and thrive. They are ready to grow their roots in different directions in search of the nutrients they require. You can learn values like adaptability, perseverance, positivity etc. from plants. In your life you may have to cope with adverse circumstances. But if you face it with positivity and perseverance you will definitely succeed. This activity will also encourage the children to observe their surroundings for these kind of survival stories.

B.2. This is a chart making activity. Teacher can ask the students to collect the seeds of various fruits and bring to the class and stick them to a chart paper with the corresponding name of the plant. It can be observed that the seeds come in different sizes, shapes and colours, but their purpose is the same. The students can also compare the sizes of the plants they grow into. Some are herbs, some are shrubs whereas some others are huge trees.

The teacher can highlight the fact that though the seeds are small, when planted in the right conditions, their potential is great. They are a symbol of humility. These small seeds in future grow into big trees. If you sow the seed in a fertile soil it will grow healthy, else it will die. Same is the case with human beings. If we are in the right company, we will grow to our full potential. Otherwise we would never develop.

Things needed: A chart paper, colour pencils, and different kinds of seeds.

B.3. This is a seed germination task. The children can be asked to collect different types of seeds (pea, beans etc. are easy to grow) and try to germinate them in a small pot of fertile soil. They can take their parents' help, if they wish to. Keep a record of the number of days it took for the germination process. This is a slow process and teaches you the value of patience. For reaping the fruits of your hard work, you have to wait patiently with hope. If you lose hope and try to dig the soil to see the status, the seed will die.

Things needed: Some pea or bean seeds, a small pot with soil.

V. Assignments

C.1. The children can be asked to make a chart on the different types of seeds and their dispersal methods. They can even collect the seeds and stick them in the chart. Also mention the adaptations of these seeds for their mode of dispersal. This activity will help to improve the observation skills and analytical thinking in the children

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Motion and Time	<p>Core Values considered: Determination, Discipline and Experience</p> <p>Other Sub-Values: as Willpower, Self-Control, Happiness and Perseverance.</p> <p>Life skills: Observation skills and scientific aptitude</p>	<ol style="list-style-type: none"> 1) A race study which helps the children to relate to values like discipline self-control, perseverance and hard work. 2) A map game which helps the children to improve their judgment and planning . 3) This is a story narration cum discussion which teaches the importance of determination and hope in life. 4) Home assignment-Data recording activity which helps to enhance observational skills and scientific aptitude of students.

Materials / Resources needed

- 1) A print out of the map given in Annexure A, Stopwatch, paper and pen.
- 2) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter deals with speed and its calculation. It also describes the various methods of measuring time and also about plotting the distance time graph.

The topics discussed are

- How to differentiate between uniform and non-uniform motion.
- The concept of speed and how to calculate it.
- How to measure speed and time and their unit .and to plot distance time graph and interpret it.
- Goal setting and planning are important in life.
- Happiness is also a relative term like the motion.
- Determination and hard work can help one reach his/ her goals.
- Importance of willpower, self-control and discipline in following one's path to success.

Unit 13**Motion and Time****Determination, Discipline and Experience****I. Introduction**

Motion of objects is not confined to our planet. It is a universal phenomenon. All the stars, planets and other heavenly bodies are in constant motion. Understanding motion is a basic requirement of all branches of science including chemistry, astronomy and even life sciences. Time and speed are two important terms in the study of motion. This chapter deals with speed and its calculation. It also describes the various methods of measuring time and also about plotting the distance time graph.

Through this chapter the teacher gets an opportunity to explain the importance of setting goals in life and moving towards it. Just like uniform motion one can move towards his goal in a relentless fashion at his / her own pace, with a determination to succeed. One has to set goals and plan his / her progress in order to achieve success. Another important concept which the teacher can try to foster in the minds of children is the truth that everybody has his/ her own speed or pace. We do not have to bother and get distracted when others move ahead of us, as long as we are in the path of our goal. This highlights the values of determination and discipline in life.

The core values focused upon are Determination, Discipline and Experience along with sub values such as Willpower, Self-Control, Happiness and Perseverance.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Know how to differentiate between uniform and non-uniform motion.
- Explain the concept of speed and how to calculate it.
- Know how to measure speed, time and their units.
- Able to plot distance time graph and interpret it.
- Realise that goal setting and planning are important in life.
- Recognise that determination and hard work can help one reach his/ her goals.

- Understand the importance of willpower and discipline in following one's path to success.

III. Process & Action Plan

A good teacher has a passion and devotion to their subject. They exhibit fun and pleasure when their students achieve and improve their skills and knowledge in a specific area. A good teacher is able to communicate this passion; indeed, they cannot hide it.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a race study which helps the children to relate to values like discipline, self-control, perseverance and hard work.
Refer B.1.

2. This is a map game which helps the children to improve their judgment and planning skills.
Refer B.2.

3. This is a story narration cum discussion which teaches the importance of determination and hope in life.
Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on data recording which helps to enhance observational skills and scientific aptitude of students.
Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *positivity, sincerity, selflessness and determination* along with other associated sub values like *kindness and love*.

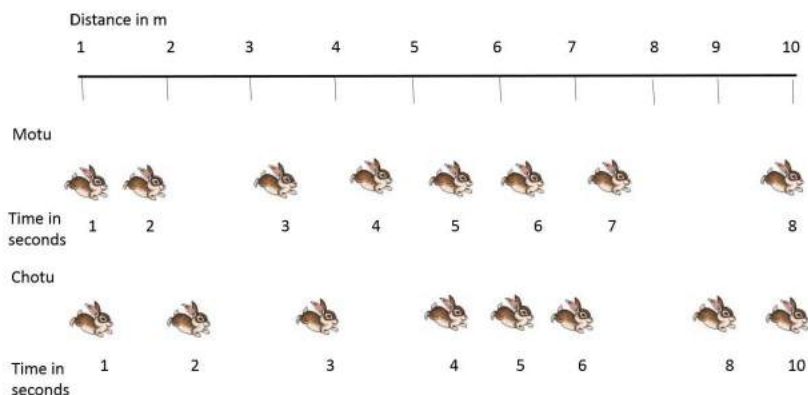
The unit also helps to develop *leadership skills and relationship building skills* in the students through the various activities. The home assignment helps the students to improve their *comprehension and writing skills*.

IV. Activities & Related Discussion

A. The teacher can start with discussion about relative speed and running races and how a reference point is needed to determine motion of objects. Teacher can explain that a person sitting in a moving train appears to be stationary for a person sitting inside the train, but appears to be moving with a speed, for a person who is standing and watching the train from a platform. Happiness is also a relative term like the motion example mentioned here. We feel sometimes that being rich makes people happy. But the rich may be facing many difficulties and may be having many frustrations in life although they have a lot of money. A person who has nothing in his hands may be happier than the one who has everything. It is always better to find happiness and satisfaction in whatever you have and avoid comparing oneself with others.

B. Activities:

B.1. This activity is based on a race between Motu rabbit and Chotu rabbit. This activity helps the students to visualize motion and to clearly differentiate between speed and position. The teacher can draw the following figure on the board and discuss the questions given below with the students.



Two rabbits Motu and Chotu are in a race as shown above and are running constantly from left to right. The distance covered and time taken are shown here. After closely observing their motion the students can be asked the following questions and the responses can be discussed.

- 1) What is the average speed of Motu and Chotu? Which rabbit has higher average speed?
- 2) At what time both the rabbits are at the same position?
- 3) When does Motu first overtake Chotu?
- 4) Who won the race?
- 5) Why do you think Chotu failed?

This activity helps the students to understand how the average speed is calculated and how position and time differ from speed. Teacher can convince the students that it is important to know own capabilities and decide on how fast or slow one should move ahead. But one has to move ahead with discipline and self-control without stopping anywhere, improving one's performance every moment. You don't have to pay attention to what others are achieving but focus on your goal. Chotu moved faster in the beginning but could not reach the goal in time whereas Motu kept on increasing his pace and reached the destination earlier than Chotu. Here the teacher can touch upon the importance of perseverance in life and explain how they should continue to work hard even in adversities.

B.2. This is an interesting map game which the children can do in groups. The teacher can prepare a locality map as shown in Annexure A and give one copy to each team. Then he /she can give the following instructions to the teams and the children can record the distances and make the required calculations. Ignore the distances where it is not mentioned.

- 1) Start from the starting point and walk 13 km through the Bond street at a speed of 5 km/hr. Turn left and walk 3 km at a speed of 3 km/hr. Where did you reach? How much time you took to reach there?
- 2) Start from the starting point and walk 3 km at a speed of 3 km/hr and turn left and walk 5 km at the same speed.. Where did you reach? How much time you took to reach there?
- 3) Start from the starting point and walk 3 km at a speed of 3 km/hr and then walk straight 10 km at the same speed. Then turn right and walk 6 km at a speed of 2 km/hr. Where did you reach? How much time you took to reach there?
- 4) From the above point turn back and walk back straight at 6 km/hr for 11 km. Where did you reach? How much time you took to reach there?
- 5) At what constant speed should a person walk so as to reach the bus station in 1 hour?
- 6) At what constant speed a person should walk from cinema to reach the factory in 2 hours? Which is the fastest route he can take?

This activity helps the students to understand the relationship between speed and time and to do the speed time calculations with accuracy and speed. This also highlights the importance of finding one's own pace and reaching your goal without any distraction. The children can be told that one should plan one's journey in such a way that it will be completed in minimum time with minimum effort. But you should not hesitate to do hard work and plan to reach your goal at the earliest. This activity also enhances judgment and planning skills. It also helps to improve the speed and accuracy in doing numerical problems.

Things needed: A print out of the map given in Annexure A.

B.3. This is activity is a story narration cum discussion. This is a familiar story from Aesop fables which can be narrated by the teacher.

A Hare was making fun of the Tortoise one day for being so slow.

"Do you ever get anywhere?" he asked with a mocking laugh.

"Yes," replied the Tortoise, "and I get there sooner than you think. I'll run you a race and prove it."

The Hare was much amused at the idea of running a race with the Tortoise, but for the fun of the thing he agreed. So the Fox, who had consented to act as judge, marked the distance and started the runners off.

The Hare was soon far out of sight, and to make the Tortoise feel very deeply how ridiculous it was for him to try a race with a Hare, he lay down beside the course to take a nap until the Tortoise should catch up. The Tortoise meanwhile kept going slowly but steadily, and, after some time, passed the place where the Hare was sleeping. But the Hare slept on very peacefully; and when at last he did wake up, the Tortoise was near the goal.

The Hare now ran his swiftest, but he could not overtake the Tortoise in time. Moral: The race is not always to the swift.

Source : <http://read.gov/aesop/025.html>

The teacher can start the discussion asking the following questions

- Whom among hare and tortoise was faster?
- Did they both have the same distance to cover?
- Why do you think the tortoise won the race?
- What does this story teach you?

The teacher can point out during the discussion that though the hare was faster than the tortoise, it was lacking focus on the goal. He was overconfident on his capabilities that led to him losing the race. Whereas the tortoise was focused and he moved at his own pace until he reached his goal. So in the race of life, it is not only speed that matters, but also your determination and discipline. One should set one's goal and do hard work relentlessly with focus to succeed. For e.g. you may be setting your exam goals. But if you don't do hard work in a continuous manner with determination, you will not reach the goal on time. Another take away from this story is that one should not get distracted or discouraged by seeing somebody else's strength. The only thing one has to concentrate is to use one's abilities to the maximum and stay in the race with hope, without getting discouraged.

V. Assignments

C.1. Home Assignment.

The children can be given a data recording activity. Teacher can ask students to go for a morning walk and record the speed of different walkers by observing the distance covered and time taken to cover that distance. They can also record the speed of different vehicles, animals etc. This will give them an idea of the difference in the range of speed between various entities under observation and make them realise the fact that each entity has its own natural pace. This will help to improve their observational skills and scientific aptitude.

Things needed: Stopwatch, paper and pen.

Resources

References:

- NCERT Class VII Science Textbook.

- <http://read.gov/aesop/025.html> - Story narration activity.
- Thumbnail (Rabbit) courtesy : www.vectorstock.com

Annexure A



Topic	Values / Life skills integrated & imbibed	Activities
Electric Current and Its Effects	<p>Core Values considered: Honesty, Kindness, Inner harmony and peace</p> <p>Other Sub-Values: as Love and Positivity</p> <p>Life skills: Observation skills and curiosity.</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion which helps to nurture love and kindness. 2) An experimental demonstration which helps the children to relate to values like positivity and honesty . 3) An experimental demonstration which teaches the importance of inner peace and harmony . 4) Home assignment-Preparing a chart which helps to enhance the observation skills and induce curiosity in the student .

Materials / Resources needed

- 1) A Connecting wire, switches, cells, iron nail.
- 2) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter elaborates on how to represent electric circuits with symbols and about the role of various elements in a circuit like the fuse and the switch. It also helps to understand the heating effect, lighting effect and magnetic effect of electric current.

The topics discussed are

- The symbolic representation of the components of an electric circuit and also understand how to draw a circuit..
- The sources of electric current and the role of switches in a circuit.
- The various effects of electric current like heating effect, lighting effect and magnetic effect.
- Wonder called electricity that is not visible, but can still make our life comfortable which can be related to love and kindness that others cannot see but can feel through our actions.
- The magnetic effect of current can be related to the fact that when you are with a good set of friends who are honest and positive. You will get energized and will be like a magnet which attracts others.
- The role of a fuse in avoiding current overload, comparing that with relieving mental stress and restoring peace and harmony of mind, by taking a break and relaxing your mind.

Unit 14**Electric Current and Its Effects****Honesty, Kindness, Inner harmony and peace****I. Introduction**

Electricity is one of the most important blessings that science has given to mankind. It has also become a part of modern life and one cannot think of a world without it. Electricity has many uses in our day to day life. It is used for lighting rooms, working fans and domestic appliances like electric stoves, A/C and more. All these provide comfort to people. This chapter elaborates on how to represent electric circuits with symbols and about the role of various elements in a circuit like the fuse and the switch. It also helps to understand the heating effect, lighting effect and magnetic effect of electric current.

This chapter provides the teacher an opportunity to elaborate on the effects of our actions on others and also on the need for taking a break to avoid mental stress. It is interesting that we cannot see the electric current but its presence can be felt by the effects it produce, like a bulb getting lit up. In the same way the love and kindness in our mind has to be felt by others through our actions. While teaching the role of electric fuse in saving our appliances from overload, the teacher can urge the students to have an occasional break from routine things and give some relaxation to their mind. This will relieve them from mental stress and fill their minds with more energy.

The core values focused upon are Honesty, Kindness, Inner harmony and peace along with sub values such as Love and Positivity.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Learn the symbolic representation of the components of an electric circuit and also understand how to draw a circuit.
- Know about the sources of electric current and the role of switches in a circuit.
- Explain the various effects of electric current like heating effect, lighting effect and magnetic effect.
- Know about how these effects are practically used in gadgets like fuse, electric bell etc.

- Appreciate the wonder called electricity that is not visible, but can still make our life comfortable.
- Realise that love and kindness are virtues that others cannot see but can feel through our actions.
- Able to relate the magnetic effect of current to the fact when you are with a good set of friends who are honest and positive, you will get energized and will be like a magnet which attracts others.
- Correlate the role of a fuse in avoiding current overload, with that of relieving mental stress and restoring peace and harmony of mind, by taking a break and relaxing your mind.

III. Process & Action Plan

“A very wise old teacher once said: I consider a day's teaching wasted if we do not all have one hearty laugh.”

- Gilbert Hight

A good teacher should have good humour sense. Humour ignites our sense of wonder, which is where learning starts, so it seems logical that humour could upgrade memory, students like to laugh and also retain the knowledge of that specific information.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

**A. Introduce the context activity:
Discussion. Refer A**



**B. Carry out the varied activities in class (given below)
in the sequence specified.**



1. This is a demonstration cum discussion which helps to nurture love and kindness.
Refer B.1.

2. This is an experimental demonstration which helps the children to relate to values like positivity and honesty.
Refer B.2.

3. This is an experimental demonstration which teaches the importance of inner peace and harmony in life.
Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Home Assignment can be given to students to come up with innovative ideas. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Honesty, Kindness, Inner harmony and peace* along with sub values such as Love and Positivity.

The unit also provides the scope to develop the following skills in the students *like observation skills and curiosity*.

IV. Activities & Related Discussion

A. The teacher can start the lesson by exploring what students already know about electricity. Ask:

- What is electricity?
- What is electrical current?
- What is an electric circuit?
- What are the essential components of a circuit?

Have them draw examples of electric circuits by using symbols. Here it can be highlighted that some components like the source, the connectors and switches are essential components of a circuit and they all should be joined in the correct sequence for the circuit to work. In life also, we may have to connect to others and need to interact harmoniously with them for accomplishing many tasks. Children can be encouraged to develop good interpersonal skills, essential for maintaining good relationships which is important for success in life.

B. Activities:

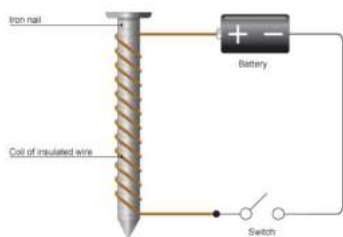
B.1. This is a demonstration cum discussion activity. Teacher can ask the students to help him/ her build a circuit with some cells, connecting wire, switch and a bulb. Once the circuit is completed and the switch turned on the bulb starts glowing. Teacher can discuss the points given below, with the students.

- Why did the bulb glow? Where did it get the energy?
- Can you see electricity flowing? Then how did you get to know that there is energy flowing?
- Which is the source of the energy?

This is an activity that helps the students to understand that you need not see something to know that it exists, just like the electric current though invisible, manifested itself by making the bulb glow. In the same manner you need not say about the love and kindness which you feel in your mind, but others will feel it through yours actions. You don't require to publish about the goodness in your heart, others will recognize and appreciate it by seeing your actions. You can support and help somebody in need without giving publicity, but people will see it and start appreciating you. Teacher can ask the students to nurture love and kindness in their mind and convert it into actions.

Things needed: Connecting wire, cells and a switch.

B.2. This is an experimental demonstration. Teacher can demonstrate that an iron nail can be converted into a magnet by making a circuit as shown in the circuit diagram. He/ She can explain that when current passes through the iron nail it behaves like a magnet.



This is an example of the magnetic effect of electric current. From this behaviour of the iron nail, children can learn a very important life lesson. When you are with a good set of friends you will get energized and will be like a magnet which attracts others. You will also learn good behaviour and will be counted as a nice human being by the others. But if you are in bad company, you will get a bad label. Teacher can advise the

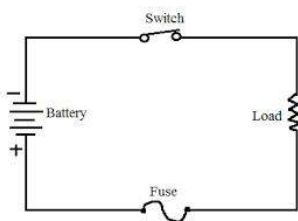
children to select good friends and be with them, which increases your energy level and makes you a good human being. Urge the children to select positive and honest people as their friends which will in turn inculcate these values in them.

Things needed: Iron nail, a cell ,a switch and a connecting wire.

Note: This activity is similar to the one given in the NCERT text book.

B.3. This is an experimental demonstration which demonstrates the role of fuse in a circuit. Teacher can construct this circuit and discuss with the children about why fuse is important in a circuit.

The teacher can initiate the discussion asking the following questions.



- How is fuse wire different from other conducting wires?
- Why is fuse important in the circuit?
- What will happen if there is a current overload ?
- What will happen if the fuse wire is not there??

The teacher can carry the discussion forward, by citing that our mind also need some relaxation from the daily stress it takes. Our daily life is full of stress and tension that overloads our mind especially for adults. It is always better to set a threshold limit and take a break from everything to relieve the stress and get involved in activities that will relax our mind. It can be pointed out to children that when they make their study timetable they should give a break in between. Then only their mind can relax, they can study further with more energy and concentration. Inner peace and harmony is a very important factor that contributes to concentration. You can go for a vacation or meditate daily to relieve the stress and make your mind strong. Otherwise it will affect our physical health and our body will become weak, just like the appliance that gets damaged when current overload happens.

V. Assignments

C.1. The children can be asked to study the appliances used daily in their homes and make a chart showing what effect of electric current is used in them. The children can prepare a chart showing the appliance name (if possible with pictures) and the type of effect the current is producing in them. For e.g. Appliance name :Electric heater -Heating effect of electric current. This activity will help to improve the observation skills and induce curiosity in the children.

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Light	<p>Core Values considered: Self-reflection, Honesty, Self-esteem and Focus.</p> <p>Other Sub-Values as Determination, Sensitivity, Positivity and Self-improvement .</p> <p>Life skills: Communication skills and presentation skills.</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion which teaches positivity ,focus and determination. 2) A demonstration which helps the children to relate to values like self-reflection and self-improvement. 3) A demonstration which teaches the importance of sensitivity 4) Home assignment-Preparing a write up which improves the communication skills and presentation skills of student

Materials / Resources needed

- 1) Flash light, 3 cardboards and clay to make a stand, a stainless steel spoon, a plane mirror, A source of white light, a triangular prism.
- 2) NCERT textbook Class VII.

Description (of the points of discussion)

In this chapter we learn about the straight line motion of light, the phenomenon of reflection and about the types of images formed by mirrors and lenses.

The topics discussed are

- Light travels along a straight line and the phenomenon of reflection of light by mirrors.
- The various types of mirrors and the characteristics of the images formed by them and also difference between real and virtual images ..
- Different types of lenses and the characteristics of images formed by them..
- White light is composed of seven colours..
- Good friends are like plane mirror who are honest and sincere.
- Mirrors teaches you that self-reflection and introspection are very important in life.
- Everything you see may not be what it appears to be just like white light is not essentially white but has many colours in it.

Unit 15**Light****Self-reflection, Honesty, Self-esteem and Focus****I. Introduction**

We all know that light is a form of energy that helps us to see things. It is a part of electromagnetic spectrum and does not require any medium for propagation. It reaches earth from the sun and helps life to survive on earth. It is considered as a symbol of knowledge, hope and intelligence. In this chapter we learn about the straight-line motion of light, the phenomenon of reflection and about the types of images formed by mirrors and lenses.

The teacher while explaining the formation of images in a mirror by reflection, can elaborate on the importance of having friendships that are honest and true. Reflection also teaches us the need for self-reflection and self-improvement. Lenses can be related to perspective and attitude i.e. how you see the world. The same world can be seen in different ways by different people, just like a lens gives different images of the same object depending on its position. The straight-line motion of light symbolizes focus and determination to reach your goal.

The core values focused upon are Self-reflection, Honesty, Self-esteem and Focus along with sub values such as Determination, Sensitivity, Positivity and Self-improvement.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Realise that light travels along a straight line.
- Explain the phenomenon of reflection of light by mirrors.
- Know about the various types of mirrors and the characteristics of the images formed by them and also differentiate between real and virtual images.
- Identify different types of lenses and describe the characteristics of images formed by them.
- Realise the fact that white light is composed of seven colours.

- Appreciate the fact that good friends are like plane mirror who are honest and sincere.
- Understand that mirrors teaches you that self-reflection and introspection are very important in life.
- Realise that everything you see may not be what it appears to be just like white light is not essentially white but has many colours in it.

III. Process & Action Plan

A good teacher cares about their students. They care about passing on information to the students in the right way. When the teacher respects the subject he teaches, the students are going to learn to respect it as well. It must be a mutual two way process

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a demonstration cum discussion which teaches positivity, focus and determination. Refer B.1.

2. This is a demonstration which helps the children to relate to values like self-reflection and self-improvement Refer B.2.

3. This is a demonstration which teaches the importance of sensitivity. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment preparing a write up which improves the communication skills and presentation skills of students. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Self-reflection, Honesty, Self-esteem and Focus* along with sub values such as *Determination, Sensitivity, Positivity and Self-improvement*.

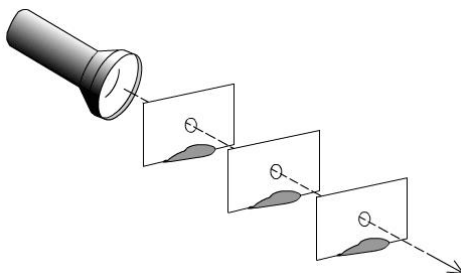
The unit also provides the scope to develop the following skills in the students like *communication skills and presentation skills*.

IV. Activities & Related Discussion

A. The teacher can start discussing about the nature of light and how it helps us to see our surroundings. The teacher can elaborate on the way we perceive light and darkness. They both are interrelated. It can be conveyed that darkness is only the absence of light. Light gets fully or partially reflected or absorbed by surfaces and helps us to see objects around us.

B. Activities:

B.1. This is a demonstration cum discussion activity. The following demonstration will make the children understand the straight line motion of light.



- Take 3 cards and make 3 holes in them and arrange them on clay stands, so that the holes come in the same line as shown in the figure.
- Place a flash light at one end of the row of the cards and turn off all the lights in the room to make it dark.

- Switch on the flash light and ask the children to write down their observation.
- Now move the last card sideways so that its hole is no more in line with the others. Ask the children to note their observation in this case.

At the end of the demonstration the teacher can ask the children to read their observations and explain to them about the straight line motion of light. The straight line motion of light can be correlated to the fact that one should be focused to reach one's goal without any distraction from one's path. One's you set your goal, be determined to reach there with a positive attitude although there may be setbacks in the path.

Things needed: Flash light, 3 cardboards and clay to make a stand.

B.2. This activity is a demonstration on reflection. Teacher can ask the students to observe their images on two sides of a new polished stainless steel spoon and that on a plane mirror.



The two sides of a spoon behave like convex and concave mirrors. Students can observe the difference in the images formed by the spoon and that by the mirror. The convex and concave surfaces of the spoon did not give us the actual reflection. They were distorted and were not exactly like the object. But the one formed by the plane mirror exactly resembles the object. Children can be told that true friends are like plane mirrors who are honest and sincere. They will give you honest advice and guide you through the right path. They will criticize you when you are wrong and try to correct you. Children should be advised to choose only such honest friends

and at the same time they should also be like the plane mirror to their friends.

Another inspiring thing about the mirror is that it teaches you that self-reflection and self-improvement are very important in life. Sometimes one may have to introspect one self and try to evolve into a better person by correcting one's bad behaviour and thoughts. A mirror reminds you about improving yourself constantly not only your external appearance but also your inner soul.

Another interesting fact about lenses is that the images formed by the lenses change according to the position of the object. This can be demonstrated by keeping the object at different distances from the lenses and observing the images formed. This can be compared to perception. The world appears to you differently when you look at it in different angles. If you look at the world in a positive perspective the world appears beautiful to you. But if you see it in a negative angle, then it looks dull. So if you want to see the world inspiring and beautiful try to see it with a different perspective. It is like

seeing a glass that is half filled with water. One can see it as half full or half empty. Always try to be positive in your approach and the world will give you a positive response.

Things needed: A stainless steel spoon, a plane mirror.

B.3. This is demonstration that shows that white light is made up of seven colours . Shine white light through a prism and onto a white piece of paper. A beautiful array of colors will be displayed. Explain the process of light refracting into its components: white light is actually made up of red, orange, yellow, green, blue, indigo and violet light.

The teacher can initiate a discussion on how the splitting of white light can be compared to the hidden talents or potential in a person. One may be having many talents in him/ her, which may lie hidden inside .These talents can be brought out only if there is someone who can identify them and nurture them. Sometimes one may not be aware of his / her potential. Someone has to identify the potential and help it to develop, like a prism which splits white light into its constituent colours. Teacher can urge the children to be like a prism to others, always encouraging and helping others to come up in life. For this to happen one should be sensitive and broadminded with caring attitude towards others. Developing these values will help one to become an adorable human being.

Things needed: A source of white light, a triangular prism.

V. Assignments

C.1. The teacher can ask the children to write a paragraph about any of their hidden talents which their classmates are unaware of. They can be asked to write about how they are going to nurture it and about the people who encourages them to pursue it. Teacher can give the children an opportunity to showcase their talents in the class if they are interested .For e.g. If a student feels that he / she has a talent for singing, he / she can be given a chance to sing in front of the class. This activity will help the children to come out of their inhibitions and improve their self-esteem. This also improves the communication skills and presentation skills of students.

Resources

References:

- NCERT Class VII Science Textbook.

Topic	Values / Life skills integrated & imbibed	Activities
Water : A Precious Resource	<p>Core Values considered: Equality, Respect, Empathy, Responsibility.</p> <p>Other Sub-Values as Sharing and Caring, Gratitude and Love for Nature..</p> <p>Life skills: C+C24ommunication and comprehension skills..</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion which teaches respect, love for nature and responsibility. 2) A fun game which helps to inculcate empathy in the minds of children . 3) A demonstration activity which teaches responsibility. 4) Home assignment-Preparing a request letter which improves the communication skills and comprehension skills of students.

Materials / Resources needed

- 1) A jar which can hold 4 litres of water, a measuring cup, Measuring cylinder, Paper Cups (3 per team), Water, Stop watch and calculator.
- 2) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter highlights the importance of conserving water and about the scarcity of drinking water in this world.

The topics discussed are

- The preciousness of water and how scarcity of drinking water is affecting mankind.
- Water cycle and the different forms in which water exists.
- The most important source of drinking water, the ground water, and how fast our water table is getting depleted and the reasons behind it.
- The different methods of water management like avoiding wastage of water, rain water harvesting, better irrigation practices etc.
- Respect mother nature and show gratitude to her for all the precious things that she has given us.
- Every one in this world has equal rights to all the natural resources and we should live a harmonious life by sharing the resources we have.
- One should be a responsible citizen and should live a disciplined life by avoiding deeds that waste water and thus set an example for others.

Unit 16**Water : A Precious Resource****Equality, Respect, Empathy, Responsibility****I. Introduction**

Water is the most valuable gift of nature. It is a resource that helps to sustain life on earth. But we, human beings, is not valuing it and are constantly polluting our water resources. We are already facing shortage of drinking water and as the saying goes, “the next war will be fought over fresh water”, we will start fighting for drinking water.

This chapter highlights the importance of conserving water and about the scarcity of drinking water in this world. The teacher can make the children aware that, when we restrain from polluting water resources and conserve water, we are showing respect to the mother nature, for all those good things she has given us.

The core values focused upon are Equality, Respect, Empathy, Responsibility and associated sub values like Sharing and Caring, Gratitude and Love for Nature.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals.

- Realise the preciousness of water and how scarcity of drinking water is affecting mankind.
- Know about water cycle and the different forms in which water exists.
- Know about the most important source of drinking water, the ground water, and how fast our water table is getting depleted and the reasons behind it.
- Understand the different methods of water management like avoiding wastage of water, rain water harvesting, better irrigation practices etc.
- Learn to respect mother nature and show gratitude to her for all the precious things that she has given us.
- Appreciate the fact that every one in this world has equal rights to all the natural resources and we should live a harmonious life by sharing the resources we have.
- Realise that one should be a responsible citizen and should live a disciplined life by avoiding deeds that waste water and thus set an example for others.

III. Process & Action Plan

Your role as a teacher will need you to be a learner always. A teacher will be challenged every day with a new task that will help them grow into a better person. Teaching is a constant learning process and a teacher should open up his /her mind for constant learning.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a demonstration cum discussion which teaches respect, love for nature and responsibility. Refer B.1.

2. This is a fun game which helps to inculcate empathy in the minds of children Refer B.2.

3. This is a demonstration activity which teaches responsibility. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment - Preparing a request letter which improves the communication skills and comprehension skills of students. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Equality, Respect, Empathy, Responsibility* and associated sub values like *Sharing and Caring, Gratitude and Love for Nature*.

The unit also provides the scope to develop the following life skills in the students : like *communication and comprehension skills*.

IV. Activities & Related Discussion

A. The teacher can start the lesson by discussing about water scarcity and how fortunate are those who have enough water for their daily use. The teacher can ask the students to narrate some incidents in their past, when they had a water cut in their home and the difficulties they had to face even for a short period. The teacher can narrate the ordeal of people who have very less access to drinking water and how we can help them as a responsible human being. It can be highlighted that every living thing whether it is a plant or an animal have equal rights to water and we should try not to grab the right of others by misusing these resources.

B. Activities:

B.1. This is a demonstration cum discussion to highlight the problem of water scarcity and also the importance of conserving water.

- Show students a globe or a map, and point out all the water on Earth. Explain that even though our “blue planet” is covered with mostly water, 97% of water on earth is salt water in the oceans and cannot be used for human consumption, agriculture, etc. Take 4000 ml (4l) of water in a jar to represent the whole of water on earth.
- Pour 120 ml of the liquid into the measuring cup to represent the 3% of fresh water that exists on the earth. Ask students to notice how little the amount is in comparison to the rest of the liquid left in the bottle.

- Out of the cup of liquid you just poured, explain to students that 2.2% of Earth's water is locked up in glaciers and unavailable for use, and less than 1% (only 0.8%) of it is actually available for everyday use from rivers and lakes.
- Pour 88 ml from the cup into the ice cube tray to signify that it is frozen water. Therefore, there should be about 32 ml of the liquid left in the measuring cup.

Explain to students that the small amount left in the measuring cup, represents the only fresh water available to humans, out of all of Earth's water, and we have to share this quantity of water with people all over the world. It can also be conveyed that every living being has equal right to fresh water and we should share this precious life sustaining resource with all. By not polluting water and recycling and reusing it, we show our respect to mother nature. Children can be encouraged to provide drinking water for animals and birds in their neighborhood. This will inculcate a love for nature and responsibility in their mind.

Things needed: A jar which can hold 4 litres of water and a measuring cup.

Note: The activity illustrated here may have similarity with the ones in the textbook. The teacher has the freedom to demonstrate the one he / she prefers, but the associated values remain the same.

(Activity courtesy: www.earthday.org/wp-content/uploads/K-4-Lesson-Plan-2.pdf)

B.2. This is a fun game called Jack and Jill game which helps the children to understand how precious water is. The children might be familiar with the famous nursery rhyme highlighting what all hardships people have to undergo, to get some drinking water.

"Jack and Jill went up the hill, To fetch a pail of water

Jack fell down and broke his crown, And Jill came tumbling after"

This is a race game. The participants of the game should be given a glass which is filled with water to the brim and should be allowed to hold it in one hand which should be stretched out. They can walk or run from the starting point of the race to the finishing point on the other end of the classroom without spilling even one drop of water. If one drop falls down, they are disqualified. The participant who reaches first at the finishing point without spilling even one drop of water is the winner.

This game makes the children realise the hardships faced by people around the world to get some drinking water. The teacher can tell the children about how women and children have to walk miles to fetch home some drinking water in many rural areas. The children will be able to empathize with them , which will make them count every drop of water they use.

B.3. This is an activity that will make children responsible for every drop of water that is wasted and they will realise that every drop counts. Ask the students if they can remember seeing a faucet dripping at home or anywhere else and guess how much water they think might be wasted in a day from a slow drip. The students can be divided into groups of 3 to 4.

- A team requires 3 paper cups. Take one plastic cup and name it as 'leak tank'. Make a small hole at the bottom.
- Measure and fill another cup with water. Name it as 'main tank'.
- Start pouring water from the main tank to the leak tank. The water will start dripping through the hole of the leak tank which should be collected by keeping a cup under leak tank.
- After one minute take the measure of water collected in the bottom cup in milliliters. Let it be X ml.
- Calculate the quantity of water lost by using the following formula:

Quantity of water lost in one minute	= X ml
Quantity of water lost in one hour	= X x 60 ml
Quantity of water lost in one day	= X x 60 x 24 ml
Quantity of water lost in one month	= X x 60 x 24 x 30 ml
Quantity of water lost in one year	= X x 60 x 24 x 30 x 365 ml.

The children can be asked to convert the final quantity into litres and see how much quantity of water is lost in one year if a small leakage is left unattended. This exercise will make the students understand the importance of avoiding leakages in household pipes and taps. This will make them aware of the quantity of water lost in leakages. They will feel the responsibility of attending to such losses and taking immediate action to avoid such losses.

Things needed: Measuring cylinder, Paper Cups (3 per team), Water, Stop watch and calculator (if needed).

(Activity idea courtesy: www.Aquarionwater.com)

V. Assignments

C.1. Home assignment:

There is a water scarcity in your area. Write a request letter to the District Collector of your area about the problems you are facing, requesting him to take immediate action to solve the issue. You can elaborate on the various ways the situation can be handled. This activity will help to improve the communication and comprehension skills of the students.

Resources

References:

- NCERT Class VII Science Textbook.
- Activity idea courtesy: www.Aquarionwater.com

Topic	Values / Life skills integrated & imbibed	Activities
Forests: Our Lifeline	<p>Core Values considered: Interdependence, Mindfulness, Environmental awareness and Patience</p> <p>Other Sub-Values as Adaptability and Humility.</p> <p>Life skills: Observation skills.</p>	<ol style="list-style-type: none"> 1) A national park visit which helps to improve the observation skills as well as inculcate values like harmony. 2) An activity to demonstrate values like humility, mindfulness and adaptability. 3) An activity which teaches the importance of environmental awareness and patience. 4) Home assignment-Preparing a list of items we get from forests to create environmental awareness and awareness of interdependency.

Materials / Resources needed

- 1) A chart paper, pictures of animals and plants, colour pencils, glue.
- 2) NCERT textbook Class VII.

Description (of the points of discussion)

This chapter gives an overview of how important forests are for us and how much all living beings are dependent on forests for survival.

The topics discussed are

- The useful things we get from forests like firewood, medicines, building materials like timber etc.
- How forests give shade and shelter to animals in addition to food and oxygen and how we are dependent on them.
- The effects of deforestation and how it leads to soil infertility, floods and drought.
- Understanding the importance of values like mindfulness and patience from trees.
- Environmental awareness is very important for saving this planet from disaster.
- Trees also teach us humility. Although trees are tall, it depends on its roots.

Unit 17**Forests: Our Lifeline****Interdependence, Mindfulness, Environmental awareness and Patience****I. Introduction**

“The forest is a peculiar organism of unlimited kindness and benevolence that makes no demands for its sustenance and extends generously the products of its life activity; it affords protection to all beings, offering shade even to the axe-man who destroys it.”
-Gautama Buddha

Since the dawn of human civilization, forests have provided us with food, resources, and energy. The history of human development is also one of forest loss and transformation, and yet despite our increasingly urbanized societies, we remain surprisingly dependent on forests and they retain a remarkable hold on our environmental values. This chapter gives an overview of how important forests are for us and how much all living beings are dependent on forests for survival.

This chapter provides an opportunity to develop environmental awareness among children. The teacher can highlight the importance of forests and how we are dependent on them. While studying the nature and type of relation existing between the various flora and fauna in the forest, the teacher can try to inculcate the values like mindfulness, adaptability, patience and humility.

The core values focused upon are Interdependence, Mindfulness, Environmental awareness and Patience along with sub values such as Adaptability and Humility.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals

- Explore the useful things we get from forests like firewood, medicines, building materials like timber etc.
- Learn how forests give shade and shelter to animals in addition to food and oxygen.
- Understand the effects of deforestation and how it leads to soil infertility, floods and drought.
- Learn the importance of values like mindfulness, patience and interdependence.

- Realise that environmental awareness is very important for saving this planet from disaster.

III. Process & Action Plan

Teachers take the place of parents in school, they guide and mould the character and personality of the student. They influence the formative years of the students. A good teacher coaxes and helps a student to understand his abilities and become a better human being.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a national park visit which helps to improve the observation skills as well as inculcate values like harmony.
Refer B.1.

2. This is an activity to demonstrate values like humility, mindfulness and adaptability .
Refer B.2.

3. This is an activity which teaches the importance of environmental awareness and patience.
Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a list of items from forests to create environmental awareness. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Interdependence, Mindfulness, Environmental awareness and Patience* along with sub values such as *Adaptability and Humility*.

The unit also provides the scope to develop the following skills in the students like observation skills.

IV. Activities & Related Discussion

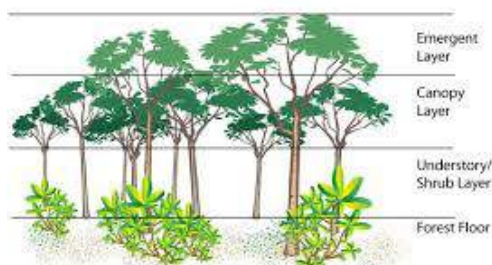
A. A. The teacher can start the lesson by asking students whether they have seen wild animals in a zoo and those in the forests. Ask the children whether they find any difference in the behaviour of animals in captivity and those living in forests. The ones in forests are happy and healthy while those kept in zoo are restless and weak. The teacher can explain that the forests are the natural habitat of wild animals and they will be living a better life in forests than in a zoo. Just like the fact that we are happy at our homes even if it is small and may not have all the facilities, rather than in any other place.

B. Activities:

B.1. The children can be taken for a visit to a nearby national park to make them understand the natural habitat of many animals and plants. This activity helps them to identify the characteristics of the ecosystem. Additionally, they can explore the diverse plant and animal life hidden in the trees and shrubs. The students will understand the interdependence of various plants and animals in the forests. They will start appreciating the harmony between the different organisms and how they live a peaceful life in the forest without causing an imbalance in the natural system. The children should be taught that living in harmony without disturbing the natural balance is very importance for sustenance of life in this planet. This activity will also help to improve the observation skills of the children.

B.2. The teacher can explain the different layers of a forest before doing this activity. The characteristics of different layers can be explained in the class and then the activity can be given.

Rainforest Structure



- Divide the class into small groups, and assign each group a layer of the rainforest.
- Students will research their area of the rainforest to include its plant and animal life.
- Have each group recreate their layer of the rainforest on the paper. Students should show the plant and animal life in that layer. For example, if a group was assigned the emergent layer, they might include the tops of trees and pictures of monkeys and butterflies.
- When each group is finished, have them present their layer to the class.

This activity will help the children to understand in details how the life in different layers interact with each other and how dependent they are on each other. The canopy layer gives shade and protect the soil from erosion and thus help to maintain fertility of the soil so that every one is benefitted. The forest floor provides a perfect place for decomposers to survive and act on dead matter and thus ensuring recycling of nutrients.

Another interesting fact to note here is that although the trees are classified into different layers, their roots are always in the ground. This teaches another important lesson that how tall you may rise, never forget your roots. Be humble in life even though you have reached great heights. You will not be able to sustain your success if you forget the tough path you covered.

The teacher can point out that trees in each layer of the forests, are adapted to survive in that particular layer. It can be noted that trees in the forest are always present and mindful of their surroundings and are responsive to the changes around them in real time. They sense these changes by paying close attention, using their equivalent of nerve cells, to shifts in temperature, wind, and light. Without paying such close attention, they'd be at risk for dropping their leaves too soon and missing out on precious sunlight that can be turned into energy. The children can be told that in the same way we also should be mindful and live in the present, sensing every change that happens around us and responsive to those changes. Trees are good at adapting to different seasons and circumstances with their agility. In the same way, if we learn to be adaptable, we can also move around smoothly through many challenges of life.

Things needed: A chart paper, pictures of animals and plants, colour pencils, glue.

B.3. The students can be asked to make a table, listing the names of some trees in the forests and the approximate life span of those trees. This helps the children to understand how much time it takes to regenerate a forest. They will realise that a tree can be cut into pieces in hours but it takes many years to make a tree grow to that height. So when we cut trees and destroy forests we should think twice because it may take decades to recreate a forest. Children will also become aware of the importance of patience in this context. They will realise that forests cannot be grown in one day. In life also one may have to patiently wait for the fruits of ones deeds. It may take a while but never lose your hope.

V. Assignments

C.1. The teacher can ask the children to prepare a list of items at their home which are made from forest products. This may include wooden furniture, medicines, food items etc. This will make the children understand our dependence on forests and they will realise why deforestation should be discouraged. They should be told that already mankind has created a lot of imbalance in nature by destroying forests and now it is their turn to set everything right. They can be told about the dangers of global warming and soil erosion and the various steps to be taken to reduce these phenomena. Creating environmental awareness in the next generation, is the only way for life to survive on earth.

Resources

References:

- NCERT Class VII Science Textbook.
- Activity B2 - idea courtesy : www.study.com

Topic	Values / Life skills integrated & imbibed	Activities
Waste Water Story	<p>Core Values considered: Positivity, Responsibility, Health and Hygiene</p> <p>Other Sub-Values as Love, Kindness and Hope.</p> <p>Life skills: Observation skills and social awareness.</p>	<ol style="list-style-type: none"> 1) A demonstration cum discussion activity to inculcate positivity and hope in children 2) A flow chart making activity that highlights values like love and affection.. 3) A video demo to inculcate responsibility in the minds of children. 4) Home assignment-Preparing a flow diagram that makes the children aware of their responsibility.

Materials / Resources needed

- 1) A Funnel, Glass beaker, Cotton balls, Sand, Muddy water, Chart paper, Colour pencils, picture card sets (which can be prepared by the teacher as given in
- 2) Annexure A)
- 3) NCERT textbook Class VII.
- 4) Visual Aids to show a video demonstration.

Description (of the points of discussion)

This chapter explains how water pollution happens and the different stages involved in the sewage treatment. It also touches upon the need for personal and social hygiene and also on the need for controlling water pollution.

The topics discussed are

- How water gets polluted and how waste water can be reused by separating impurities from it.
- The various processes involved in waste water treatment.
- How to be a socially responsible citizen following better housekeeping practices.
- The ill effects of open defecation and also why and how good sanitation practices are to be followed.
- To be a responsible citizen and help to keep our environment clean and healthy.
- You can transform any one with your approach and attitude just like dirty water is converted to pure water. Being kind and pouring love are the virtues that can even transform a filthy mind into a good one.

Unit 18**Waste Water Story****Positivity, Responsibility, Health and Hygiene****I. Introduction**

We know that water is an essential renewable resource. But due to various factors like increase in population, industrial development, pollution etc., the availability of drinking water has shrunk to a drastic level. One of the immediate solutions for these problems is following the 3 R's i.e. reduce, reuse and recycle. Several countries successfully recycle the water up to the consumable standards.

This chapter explains how water pollution happens and the different stages involved in the sewage treatment. It also touches upon the need for personal and social hygiene and also on the need for controlling water pollution. While teaching about the various methods of purification of waste water the teacher can highlight the fact that even our mind has to undergo purification sometimes, when it is filled with filthy thoughts and bad feelings. It can also be pointed out that if we treat people with love and kindness, even the evil ones are transformed into good ones.

The core values focused upon are Positivity, Responsibility, Health and Hygiene and associated sub values like Love, Kindness and Hope.

II. Learning Objectives / Outcomes

Through this unit, the students will achieve the following grade appropriate academic and value based goals.

- Realise how water gets polluted and how waste water can be reused by separating impurities from it.
- Know about the various processes involved in waste water treatment.
- Learn how to be a socially responsible citizen following better housekeeping practices.
- Know about the ill effects of open defaecation and also why and how good sanitation practices are to be followed.
- Learn to be a responsible citizen and help to keep our environment clean and healthy.
- Realise the fact that you can transform any one with your approach and attitude just like

dirty water is converted to pure water. Being kind and loving to others are the virtues that can even transform a filthy mind into a good soul.

III. Process & Action Plan

Teachers are great leaders who support students' and school's success. Teachers play a major role in students' over all development and need to be recognised as positive agents of educational change in every country.

The values and life skills integration within this unit may follow the following process and action plan, as depicted in the flow chart below:

A. Introduce the context activity:

Discussion. Refer A



B. Carry out the varied activities in class (given below) in the sequence specified.



1. This is a demonstration cum discussion activity to inculcate positivity and hope in children. Refer B.1.

2. This is a flow chart making activity that highlights values like love and affection. Refer B.2.

3. This is a video demo to inculcate responsibility in the minds of children. Refer B.3.



C. Aid generalization of the concepts learnt, through assignments (given below).



1. Assignment on preparing a flow diagram that makes the children aware of their responsibility. Refer.C.1.

While it would be ideal to expose the students to all the activities as given, and the discussion that would ensue, you may choose as per your convenience and availability of time, the activities that would be relevant to the content being taught and/or suited to the cognitive and emotional maturity of the students.

This topic incorporates the **core approach** - Knowing, Understanding, Valuing and Acting the values embedded in the topic.

The **core values** being considered are *Positivity, Responsibility, Health and Hygiene* and associated sub values like *Love, Kindness and Hope*.

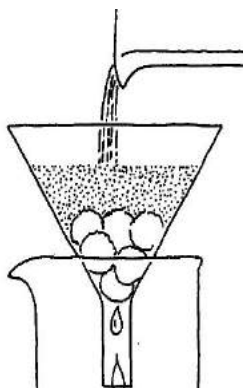
The unit also provides the scope to develop life skills in the students *like observation skills and social awareness*.

IV. Activities & Related Discussion

A. The teacher can start the lesson by discussing about how our actions are making pure water dirty and not usable for drinking. The teacher can point out the importance of three R's of water conservation i.e. Reduce, Reuse and Recycle. He /She can ask students to list out the activities for which water can be reused and for which it has to be treated and recycled. For e.g. water from kitchen can be reused without treatment to water the plants in the garden. Water after bathing can be treated in a sewage treatment plant and recycled to the flush tanks in toilets. This will encourage the children to be innovative and responsible and find new arenas for reusing and recycling water, in their day to day life.

B. Activities:

B.1. This is a demonstration cum discussion activity. The teacher can demonstrate a sample water purification bed in the class and explain the process of removing impurities from water. The details are given below.



- Prepare some muddy water.
- Take a funnel and pack some cotton balls in its bottom portion as shown in the figure.
- Pour washed sand into the funnel so it is 2'' below the top.
- Keep the funnel into the top of a glass beaker.
- Pour the muddy water into the funnel very slowly.

The teacher can ask the children what they have observed. The muddy water has changed into clear one. This shows how filtration help to remove impurities from muddy water and make it pure.

The children can be told that our mind also requires a purification from the bad thoughts and feelings we have accumulated, which makes it filthy and full of negative energy. We have to filter out the negative thoughts and feelings and make our mind clear like the pure water. For this one may have to use techniques like meditation and prayer, to get rid of negativity and fill one's mind with positivity. This helps us to be hopeful in life and brings success in all our endeavors.

Things needed: Funnel, Glass beaker, Cotton balls, Sand, Muddy water.

(Activity courtesy : <https://www.aquarionwater.com/education/lesson-plans>)

B.2. This is a flow chart making activity which will help the students to identify the various processes involved in the treatment of water for recycling.

- The teacher can take a print of the pictures given as Annexure A and make 2 to 3 sets of picture cards from it.
- After explaining about the various stages involved in sewage treatment the teacher can divide the students into 2 or 3 groups.
- Distribute the sets of picture cards among the groups.
- Ask each group to paste the cards in a flow chart in the proper order.

This activity helps the children to get familiarized with the various steps involved in the sewage water treatment.

In this context the teacher can enlighten the students with a life lesson which they can learn from these processes. The children have now understood that even the dirtiest water can be made into pure water with proper treatment. Likewise, we can change the attitude of any person from bad to good, by giving due respect and love to him / her. You can transform any harsh and rough minded person into a soft and affectionate one, by pouring love and kindness to him/her. We can change the mind of any one in our favour, if we approach them with a positive attitude.

Things needed; Chart paper, Colour pencils, picture card sets (which can be prepared by the teacher).

B.3. This is a video demo on open defecation eradication program. By showing this video the teacher can encourage the students to be responsible towards the society by playing their part in the Swachh Bharat Mission initiated by Government of India to transform our country into a ODF (open defecation free) country.

<https://www.worldbank.org/en/news/feature/2015/12/15/ending-open-defecation-achieving-clean-and-healthy-rural-india>

The children can be made aware of their responsibility as a dutiful citizen to work for making this nation a clean and hygienic one. They can be motivated to be the flag bearers of this movement and work in association with the local authorities in their area to make

people aware of the need of eradicating open defecation and the need for having toilets in every house.

V. Assignments

C.1.Home assignment:

The students can be asked to make a flow diagram of the various inlets and outlets of water into and out of their houses. They can also trace, from where the water is coming and where it goes after various usages in their houses. For eg. For houses in urban areas who have local administrative body's water connection, the water in the kitchen may be coming from drinking water treatment plants. For houses in rural areas, it may be from a household well.

Also ask the children to identify the various methods by which this water is made safe for drinking at home say, by boiling or using a home water purifier etc. The children can represent all these in their diagram, if they wish. This activity will help them to be aware of their house hold water sources and disposal of waste water and also make them feel the responsibility of ensuring that, they adhere to safe and hygienic practices. This activity also helps to improve their observation skills and social awareness.

Things needed; Chart paper, Colour pencils.

Resources

References:

- NCERT Class VII Science Textbook.
- Thumbnail courtesy: www.researchgate.net/figure/Schematic-diagram-of-a-surface-aeration-tank-10_fig2_305325229, www.quora.com, www.dreamstime.com, www.theconstructor.org, www.extension.uga.edu, www.seftgroup.com.

SCIENCE

Grade VII

Integration of Values

Teacher's Manual

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