

Maths Grade VII

ntegration 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

Maths

Grade VII

IDEA conceived and executed by

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First Edition: 2021

Publisher: HEMA Foundation Ram Ratna House, Oasis Complex, P. B. Marg, Worli, Mumbai - 400 013 Tel.: 022-2494 9009 / 9142, Extn.: 6178 Mob: 72280 01342 E-mail: admin@hemafoundation.org Website: www.hemafoundation.org

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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 stake holders 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,

Anita Maheshwari Trustee & Creative Director

Mahendra

Mahendra Kabra Managing Trustee

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 and the Trustee and Creative Director, Smt. Anita Maheswari, 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 stduents 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, swachchhata, 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 Vijayam Ravi, PhD 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.





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



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

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01 <u>Unit 1</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	8
VI.	Resources	8

02 <u>Unit 2</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	9
VI.	Resources	9

03 <u>Unit 3</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	6
VI.	Resources	6

04 <u>Unit 4</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	7
VI.	Resources	7

05 <u>Unit 5</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	1
IV.	Activities & Related Discussion	3
V.	Assignments	6
VI.	Resources	6

06 <u>Unit 6</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	8
VI.	Resources	8

07 <u>Unit 7</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	8
VI.	Resources	8

08 <u>Unit 8</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	8
VI.	Resources	8

09 <u>Unit 9</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	6
VI.	Resources	6

10 <u>Unit 10</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	8
VI.	Resources	8

11 <u>Unit 11</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	6
VI.	Resources	7

12 <u>Unit 12</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	6
VI.	Resources	6

13 <u>Unit 13</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	7
VI.	Resources	7

14 <u>Unit 14</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	8
VI.	Resources	8

15 <u>Unit 15</u>

I.	Introduction	1
II.	Learning Objectives / Outcomes	1
III.	Process & Action Plan	2
IV.	Activities & Related Discussion	4
V.	Assignments	7
VI.	Resources	7



Topic	Values / Life skills integrated & imbibed	Activities
Integers	Core Values considered : Self Confidence & Optimism, Rightousness	Value integration Activities:- 1.Discussion and using worksheets of puzzles teacher shall revise the previous knowledge of students.
	Other Sub-Values: creativity, kindness, self- esteem, positivity, determination Life skills: critical thinking, logical thinking, computing, and observation, problem solving	 2. Discussion ,Q& And class room activity teacher shall - instil in students self confidence, optimism and self esteem 3.Story narration & discussions -teacher inculcate righteousness and kindness among students 4. Assignment: Prepare Optimism & Righteous quotes and display in school bulletin board.

Materials / Resources needed

Value Integration:-

- 1. Puzzle work sheets, sheets of paper, pen or pencil, some magazines or stencils, scissors and glue.
- 2. Facilities and Equipment to show videos & conducting games
- 3. BB, Pen
- 4. Ncert Text Book, Reference books,(R.D Sharma , R.S. Aggarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities are incorporated in such a manner that students learn self-confidence and optimism but in while using properties they learn different ways of approaching a situation or solving a problem. In addition to this the teacher can teach students the importance of being righteous, the path that one chooses will lead one to success but it is equally important to achieve this success in a morally correct manner. The journey is as important as the destination

The key discussions are:

1. Discussion and using worksheets of puzzles - teacher shall revise the previous knowledge of students.

2. Discussion ,Q& And class room activity teacher shall - instil in students self confidence, optimism and self esteem

3. Story narration & discussions -teacher inculcate righteousness and kindness among students

4. Assignment:

Prepare Optimism & Righteous quotes and display in school bulletin board.

<u>Unit 1</u>

<u>Integers</u> Self Confidence, Rightousness& Optimism

I. Introduction

As introduced in class VI, Integers are a bigger collection of numbers which is formed by whole numbers and their negatives, the representation of integers on the number line and their addition and subtraction. In class VII, we discuss about properties addition, subtraction, multiplication and division of integers. Through this lesson, teachers can teach importance of values such as self-confidence and optimism but while using properties they learn different ways of approaching a situation or solving a problem. In addition to this the teacher can teach students the importance of being righteous, the path that one chooses will lead one to success but it is equally important to achieve this success in a morally correct manner. The journey is as important as the destination

II. Learning Objectives / Outcomes

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

- Differentiate between whole numbers and integers and give concrete examples.
- Represent integers on a number line and perform operations and verify properties of integers
- Apply properties of addition and subtraction, multiplication & division of integers and simplify arithmetic expressions.
- Apply rules of multiplication of integers and solve various arithmetic expressions and contextual problems
- Apply properties of addition, subtraction and multiplication of integers and devise methods for easier calculation and solve problems based on real life related to integers
- Infer division of integers as inverse operation of multiplication and write multiplication statement into corresponding division statement.
- Gain self-confidence and optimism while learning integers
- Understand the concept of being righteous while choosing the path of life journey.

Integers are a collection of positive numbers, negative numbers and Zero. More specifically even and odd integers, operations on even and odd numbers, prime numbers and composite numbers. But here more than this students study about four operation of numbers, representation of numbers on number line and rules and properties related to these operations. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Self-confidence, righteousness and optimism along with other sub-values like creativity, kindness, self-esteem, positivity, determination.

The unit also provides the scope to develop the following life skills in the students: *logical thinking, computing, and observation, problem solving, critical thinking.*

IV. Activities & Related Discussion

A: The context activity for the teacher to start:

By solving puzzles worksheet teacher revise the previous knowledge of integers

A1: Each Puzzle contains the number 21 to 29. Each column and each row add up to the number given outside the boxes. Put the correct number in each box to complete the addition equations without repeating any numbers



A2: Sudoku is a fun logic puzzle that lets kids use their logical reasoning and critical thinking skills. On this worksheet, kids help a zebra solve four Sudoku puzzles. In each row, column, and block the numbers 1, 2, 3, and 4 must appear once and only once.



https://www.education.com/worksheet/article/zebra-sudoku-second/ https://in.pinterest.com/pin/18858892168410877/ https://in.pinterest.com/pin/461478293049274491/ https://www.pinterest.de/pin/605734218610361297/

B: Value Based Activity

1. Discuss with your students by asking these questions, what confidence control is and why it is so important.

- Where and when do you feel the most confident and sure of yourself?
- What kind of new things can someone try when they are feeling confident?
- What advice would you have for a friend who wasn't confident about a trying a new activity?
- What are some ways you can show you are confident?
- · How do you think failure can impact your confidence?

Teacher shall discuss and get different perspective of students which will be good learning for all students and conclude by saying "Self-confidence is a superpower. Once you start to believe in yourself, magic starts happening".

Believe you are powerful, believe you are strong, believe you can achieve your goals, believe in the promise of tomorrow, believe you can fulfil your dreams, believe in yourself

2. Discuss with your students by asking these questions, Optimism is and why is it so important.

- What do you think it means to think positively and be optimistic?
- Do you know anybody who always seems to be thinking positively? What's something you like or admire about them?
- What are the three things that you can say to yourself when you are feeling down or frustrated?
- Who is one optimistic person that helps you to feel positive about your goals?
- Say one positive habit you have? Write one negative habit you have and write how can you make it positive?

Teacher shall discuss and get different perspective of students which will be good learning for all students and conclude by saying "Optimism is a great magnet. If you stay positive, good things and good people will be drawn to you" Mary Lou Retton

3. Teacher shall take some activities like

1. "I Am"

One of the most popular classroom activities to build self-esteem to facilitate at all grade levels is the "I Am" activity. It utilizes the effective and positive affirmation technique. Students are encouraged to think positively and with energy about what makes them who they are. The idea is that by writing down such positive thoughts, they are reinforced in the students' minds, and by thinking about themselves and their attributes positively, their self-esteem is heightened.

To do the "I Am" activity, students will each need:

A sheet of paper, A pen or pencil, Some magazines or stencils, Scissors and glue On the paper, students create a list of "I am". Some examples include: "I am a hard worker." and "I am good at basketball." Each sentence must begin with "I am…" The student writes down as many positive attributes and qualities about him or herself as he or she can think. Then the students may decorate their list by adding magazine cut outs of things they like or by drawing, etc. The idea is that students will either keep these throughout the year, or they will be hung up in the classroom so they and their classmates remember to be positive throughout the year.

2. Flip

The classroom activity is called "Flip". Students are to make a list of their mistakes, failures, and obstacles in life, but after having done so, they must "flip" them

so that they are positive. The idea is to allow students the opportunity to self-evaluate, problem solve, and improve themselves.

For example, a student might list "I failed a math quiz." A means of flipping this could be: "I will study harder to pass the next quiz" or "I will ask the teacher for help understanding the material on the last quiz."

A variation on this activity would be to have each student make a list of their mistakes, failures, and obstacles in life, but then place them in groups. Each group will brainstorm ideas to help individuals flip their listed items.

https://teach.com/blog/6-self-esteem-building-activities-for-middle-school-students

B:2: Short Story #3 – Righteousness

In the past India has been ruled by many kings who were righteous in every way. The welfare of their subjects was very important to them. Their concern extended to animals and birds also. They were following the rules of dharma shastras meticulously. Here is a story of such a king. His name was Shiby. His sense of dharma was known far and wide.

One day Shiby was sitting on his throne in the darbar hall. Suddenly a dove flew in and fell right into the kings's lap. It was shivering with fright and pleaded with the king to save its life. Hardly had the king given his word of protection to the dove than a big eagle appeared on the scene. It had blood shot eyes and its talons were very sharp. It told the king, "O wise monarch, this dove is my natural prey. Leave it to me. Otherwise, I will have to die of hunger and you will be responsible for it". On hearing this the dove looked at the king piteously and pleaded again and again to be saved from the clutches of the eagle.

The king was now in a dilemma. If he allows the eagle to eat the dove, he will be breaking his pledge to save it. On the other hand if he does not give up the dove, the eagle will die of hunger. Either way, he will be breaking a tenet of his dharma. He offered the eagle some other meat which the eagle straightaway refused. Finally, the king offered the eagle freshly cut flesh from his own body equal in weight to that of the dove. The eagle agreed to this offer.

The king ordered his servants to bring a balance and placing the dove on one side of the scale he started cutting off flesh from his own body and placing it on the other scale. But however much flesh he may place on the scale, the dove weighed more than that. Finally, the king himself sat on the scale and offered whole of his body to the eagle. The moment he did so, both the eagle and dove disappeared from the sight and two celestial beings stood there. One of them told the king, "O monarch! I am Indra and this is Agni Deva. We wanted to test your sense of dharma and you have won. Now rule the country happily for many more years".

So saying, both of them blessed the king and disappeared. The king looked at his body and saw that there was not even a scratch on it leave alone a wound!

Discussion:

- 1. What did happen in the Darbar hall of King Shiby?
- 2. What did the eagle say to the King?
- 3. What was the dilemma of the king?
- 4. What did the King offer to the eagle to solve the problem?
- 5. What did you learn from the story?

Teacher shall explain to the students that being righteous is always give you benefits. http://thathascorner.blogspot.com/2012/01/short-story-3-righteousness.html

V. C: Assignments

C1: Prepare Optimism & Righteous quotes and display in school bulletin board.

Resources

References:

Ncert Textbook, Reference books,(R.D Sharma , R.S.Aggarwal)



Topic i	Values / Life skills integrated & imbibed	Activities
Fractions& Decimals	Core Values considered : Sharing, Inter- connectedness, Interdependence	Value integration Activities:- 1.Discussions & solving worksheet
		2.Through discussion and study on the topic given by teacher s
	Other Sub-Values: generosity, gratitude, harmony, inter-relationship	4.Assignment: Study on interconnected/interdependence in school system
	observation, computing	

Materials / Resources needed

Value Integration:-

- 1. Worksheets to solve in the class for the context activity
- 2. Facilities and Equipment to show videos
- 3. NCERT Text Book, Reference books, (R.D Sharma, R.S.Aggarwal) P

Description (of the points of discussion)

Value Integration:-

In this chapter the activities are incorporated in such a manner that While learning the lesson students

learn to relate fraction & decimals in real life situations. Here one thing we shall notice that inter connectedness between fractions and decimals other than what we have studied in the previous class sharing and precision for fraction and decimals. In essence, all life is connected to other life because we all exist in the same space. We share the air we breathe, the sources of food we eat (or make ourselves), the space we live in.

The key discussions are:

1.By discussions, by solving worksheet teacher revise the previous knowledge of fractions and decimals

2. Through discussion and study on the topic given by teacher students learn the significance of interconnectedness, sharing, generosity and interdependences required in life

4.Assignment: Study on interconnected/interdependence in school system

<u>Unit 2</u> <u>Fractions and Decimals</u> Sharing, Inter-connectedness

I. Introduction

Fractions are parts of a whole or parts of a collection. Decimal number is another way of representing fractions. Decimals use a system of numbers based on units of tens, which results in the spaces past the decimal point as tenths, hundredths, thousandths and so on. Fractions and decimals are similar because they both are ways to express partial numbers. Additionally, fractions can be expressed as decimals by performing the division of the ratio.

Through this lesson we learn how everything in this world is interconnected to each other, we also learn valuable lessons of sharing and precision through fraction and decimals. In essence, all life is connected to each other, this is because we all live in the same space. We share the air we breathe, the sources of food we eat (or make ourselves), the space we live in.

II. Learning Objectives / Outcomes

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

- Define proper, improper and mixed fractions and distinguish between them
- Learn multiplication and division of fractions & decimals
- · Convert decimals into fractions
- Acquaint with different aspects of mathematics used in daily life, especially the application of multiplication and division of fractions and decimals
- Learn the importance of sharing, Interconnectedness, precision and the significance of applying the same to life.
- · Gain self-confidence and optimism while learning integers
- Understand the concept of being righteous while choosing the path of life journey.

Decimals and Fractions are just different ways of showing the same value. Fractions are useful in many contexts. Fractions are commonly used in everyday life as well as in mathematics. The relationship between fractions and decimals is very important to understand to develop a strong base in arithmetic. Through this lesson, students explore the relationship between fractions and decimals by learning how to convert fractions to decimals and decimals to fractions with the help of visualizations, interesting simulations. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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

A. Introduce the **context** activity: Solving worksheets. Ref-A1, A2, A3 & A4

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

Sharing, Inter connectedness & Interdependence.

Study on the topics Water cycle, Forest eco system, Human body inter related system and give presentation. Ref-B (1, 2, 3, 4

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

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

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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Sharing, Inter-connectedness & interdependence along with other sub-values like' generosity, gratitude, harmony, relationships.

The unit also provides the scope to develop the following life skills in the students: *thinking, observation, computing.*

IV. Activities & Related Discussion

A: The context activity for the teacher to start:

Teacher revised the previous knowledge by using puzzle worksheet given below-Total-Difference Puzzle

A1: Eg. Fill in the missing numbers puzzles in the puzzle below



Ref: https://roleplayersensemble.com/
A2: Write the fraction of the colored boxes in the space provided and then add the fractions together



2)
$$\frac{4}{8} + \frac{1}{4} =$$
 7) $\frac{3}{6} + \frac{2}{12} =$ 12) $2\frac{7}{27} + 8\frac{5}{9} =$
3) $\frac{1}{3} + \frac{3}{9} =$ 8) $\frac{4}{14} + \frac{1}{7} =$ 13) $7\frac{4}{5} - 3\frac{8}{20} =$
4) $\frac{3}{5} - \frac{1}{3} =$ 9) $\frac{1}{3} + \frac{3}{9} =$ 14) $9\frac{8}{20} - 4\frac{2}{5} =$
5) $\frac{2}{3} - \frac{1}{2} =$ 10) $\frac{4}{12} - \frac{1}{3} =$ 15) $3\frac{1}{7} + 5\frac{12}{21} =$

A4:Compare the Following (less than, (<) greater than (>) or equal to (=)

A5: Find the missing Factor

1) $4\frac{1}{2} - = 2\frac{7}{8}$	3) $+8\frac{7}{8} = 13\frac{3}{8}$
2) $1\frac{1}{2} = 11$	4) $7\frac{5}{8} - = 5\frac{3}{8}$

https://www.education.com/worksheet/article/fraction-review-addition-subtraction-inequalities/

https://www.education.com/worksheet/article/fraction-addition-3/

B: Value Based Activities:

Teacher shall elicit examples of interconnectedness, interdependence and interrelation. Teacher shall divide the class into groups and give them the topic for study on the following topic and give presentation after discussing with them and guiding them so that they will experience the inter connectedness exist everywhere around them.



1. How does the water cycle demonstrate interconnection?-Group-1

The water cycle involves a series of interconnected pathways involving both the biotic and abiotic components of the biosphere. ... Water evaporates from the surface of the oceans, leaving behind salts. As the water vapor rises, it collects and is stored in clouds. As water cools in the clouds, condensation occurs. Teacher shall explain the beauty and significance of interconnectedness. At the same time each state of change they share and it come back to them abundantly. We are connected to nature and dependent on it for the things we need to keep us alive.



2. Forest Ecosystem Connections: Fungi-Group-2

Take a closer look at how the web is constructed as well as how organisms within the food web are connected.

The Producers - the trees, shrubs and plants.

The Primary Consumers - the mice, squirrels and rabbits.

The Secondary Consumers – the fox and hawk.

The Scavengers – the turkey vulture and fox.

The Decomposers or Detritivores - mushrooms, insects and microorganisms.

The trees, shrubs and moss are all **producers**. They turn water and sunlight into the energy they need to live and grow, through a process called photosynthesis. The cottontail rabbit eating the grass is a **primary consumer** while the red fox, which eats the rabbit, is a **secondary consumer**.

Scavengers play an important role the food web. They keep an ecosystem free of the bodies of dead animals, or carrion. **Scavengers/Decomposers** break down this organic material and recycle it into the ecosystem as nutrients. ... Vultures only eat the bodies of dead animals. Fungi that play a vital role in the forest ecosystem by cycling energy cycling

within, and between, ecosystems. Fungi protect trees by forming a sheath on the root-tip and stimulating root-tip production. They help capture water and nutrients such as phosphorus and nitrogen from the soil to sustain the life of the plant. The fungi receive sugar from the tree in exchange.

Through the above example students learn how every living and non-living thing coexist in harmony and maintain balance in the surrounding environment. One should strive to achieve this kind of equilibrium and harmony in all relationships that one has with the world, thus contributing to maintaining balance in the world.

Ref: https://www.exploringnature.org/db/view/Forest-Food-Webs

3. The human body is made up of several inter-connected systems that work together to maintain a stable internal environment-Group-(3-13). Each system connectedness



Each of our body systems are interconnected and dependent on each other. Our heart, which is part of our circulatory system, does not beat unless our brain, which is part of our nervous system, our skeletal system is dependent on our digestive system for increase in size and strength.

Through this above example, students learn the critical functions that one's body conducts on a day-to-day basis to sustain itself; it teaches one to care about one's health and build healthy habits to ensure one's body is operating at optimal levels of health.

https://www.sciencelearn.org.nz/images/2307-the-body-s-systems

4. Teacher shall conclude the importance of interconnectedness in life

We depend on others in many ways and they depend on us too. We need others; others need us.

We are also connected to our family and friends and our community. They share our good times and bad times. They care about us and support us when we need help, when we are

sad or injured, or unable to do things on our own. Wise people have always considered friendship very important for human happiness. Without friends we are on our own and life is more difficult and less enjoyable.

So, our happiness and the happiness of others are connected. When we contribute to the happiness of others, we also become happier. We benefit when we do things that benefit others. Thoughts, words and actions that flow from an awareness of our connectedness will be conducive to happiness for us and for others. Connecting positively brings sharing, generosity and friendship. Positive connections will be characterized by respect, friendliness, empathy, appreciation and gratitude. We appreciate our connections to others and are grateful for those who help us. We practice goodwill and friendliness to all and look for ways to make harmonious connections with family, friends, and community and with nature. Finding our peace and love within and then living from that point is the way to positively influence the world.

V. C: Assignments

C1: Prepare Inter connectedness of School Environment and present in class (Teacher shall continue the same groups to make presentation)

Resources

References:

 $1.https://www.earthlawcenter.org/blog-entries/2018/8/earth-law-reflecting-the-interconnectedness-of-nature \#_edn16$

2.https://www.wisdomparenting.org/wisdom/everything-is-interconnected/

3.https://www.Ref: 4.https://www.exploringnature.org/db/view/Forest-Food-Webs.sciencelearn.org.nz/images/2307-the-body-s-systems

5. https://www.education.com/worksheet/article/fraction-review-addition-subtraction-inequalities/

6.https://www.education.com/worksheet/article/fraction-addition-3/

7. <u>https://roleplayersensemble.com/</u>

8. Ncert Textbook, Reference books,(R.D Sharma , R.S.Aggarwal)



Topic	Values / Life skills integrated & imbibed	Activities
Data Handling	Core Values considered: Fairness : Responsibility & Decision Making	Value integration Activities:- 1.Discussion and doing a survey by students in the class room & Interpretation of a bar graph
	Other Sub-Values: justice, respect, patience, teamwork, cleanliness, discipline, honesty	2.Assignment topics for research and taking the report and presentation teacher
	Life skills: interpret, categorise, tabulation, computation. communication, listening, observation, analysing	3.Assignment: Prepare slogans/posters for the school premises for the research topics (Save Electricity, Save Water, Clean School, Disciplined school)

Materials / Resources needed

Value Integration:-

- 1. BB, Pen, Duster,
- 2. Facilities and Equipment to show videos.
- 3. NCERT Text books, reference books (R.D. Sharma, R.S Agarwal)
- 4. Worksheet of barograph with questions &

Description (of the points of discussion)

Value Integration:-

In this chapter the activities are incorporated to teach students how the data is collected and the ways in which it can be represented will enhance the skills of the individual like discipline, respect and learn the value of fairness and responsibility of presenting and handling situations in their life. Further this chapter discuss about representation of numbers using bars of uniform widths and double bar graphs to compare two collections of data at a glance. This chapter introduce the concept of probability, situations which are certain to happen, may happen but not certain. Students acquire the understanding of the chance of an event. They learn the ability of decision making with courage as per situations

The key discussions are:

1.By discussion and doing a survey by students in the class room & Interpretation of a bar graph teacher shall revise the previous knowledge of students.

2. By assigning topics for research and taking the report and presentation teacher shall instil the value of responsibility, discipline, fairness, decision making , honesty ,cleanliness & confidence among students

3.Assignment:

Prepare slogans/posters for the school premises for the research topics (Save Electricity, Save Water, Clean School, Disciplined school)

<u>Unit 3</u>

Data Handling

Fairness, Responsibility, Decision making

I. Introduction

Data handling refers to the process of gathering, recording and presenting information in a way that is helpful to others for instance, in graphs or charts. Data handling is a set of skills, which includes: Collecting data using a planned methodology. Recording data with precision and accuracy. Analysing data to draw conclusions. Sharing data in a way which is useful to others. Further in this chapter we study regarding representative value like mean, median & mode which is also called measures of central tendency. Central tendency is defined as "the statistical measure that identifies a single value as representative of an entire distribution. It aims to provide an accurate description of the entire data. It is the single value that is most typical fair and accurate representative of the collected data. With this students learn the value of **fairness and responsibility** of presenting and handling situations in their life. Further this chapter discusses about representation of numbers in a visual manner to compare different collections of data briefly.

This chapter introduces the concept of probability, situations which are certain to happen, may happen but not certain. Students acquire the skills to analyse chance of an event occurring. They learn the ability of **decision making** with **courage** as per situations

II. Learning Objectives / Outcomes

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

- Recollect data, the necessity of collection of data, organization of data and representation of data.
- Acquire the knowledge of finding representative value of given data arithmetic
 m e a n ,
 range, mode and median.
- Acquire the knowledge of reading and interpreting data in bar graphs and double bar graphs.

- · Acquire the understanding of the chance of happening an event and its probability
- Calculates the variability in real life situation and appreciate the variation observed in real life situations.
- Learn to be responsible & fair while handling different circumstances and able to take right decisions with courage as per situations.

III. Process & Action Plan

Data Handling dealt with the collection, recording and presentation of data which help us organise our experiences and draw inferences from them. In this Chapter, it has taken one more step towards learning how to do this. When we relate observations to real-life examples, and then understand its usage practically. Data handling allows children to make sense of information, to identify patterns and trends and to predict and plan for the future. In our day to day life, there are so many situations when we say that this is impossible, or this is possible, or this may or may not possible. So the situations which may or may not happen have the chance to happen. Probability is the study of uncertainty, the uncertainty of any doubtful situation is measured by means of Probability. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing, Understanding, Valuing and Acting</u> the values embedded in the topic.

The core values being considered are Fairness, Responsibility, Decision making along with other sub-values like justice, respect, patience, teamwork, cleanliness, discipline, honesty, confidence

The unit also provides the scope to develop the following life skills in the students: *communication, listening, observation, analysing, categorisation, interpretation, tabulation, computation*

IV. Activities & Related Discussion

A: Context activity for the Teacher to Start

A1: Teacher shall divide students into groups and instruct group I to do the survey in the class to find out what jobs your classmates would like to do when they are adults.

Teacher shall guide students and explain to them before they start the survey. The teacher should provide assistance with the classifying where necessary.

What job would you like to have when you are an adult? Perhaps you might like to be a singer, dancer, actor, nurse, teacher, pilot, doctor, lawyer or a taxi driver. Describe the job to your group.

Collect the data and write the information in this table. You might need to add some more rows

Career Choice of classmates Job	Number of students

Teacher shall ask group II to frame questions and interpret the data.

1. Which is the most popular job? How many children would like to do this job?

2. How many different jobs are shown in the table?

3. Now use square paper to draw a bar graph using your new groups. Remember to give your graph a title.

4. Was it useful to group the data in this way? Explain.

The activity also provides learners with the opportunity to practice the collection of data representation of the data in a table and the drawing of a bar graph.

A2: Mr. Andrew has drawn this bar graph to show the data that number of customers (out of 200) choosing each service (from 200 questionnaires):



Look carefully at Andrew's graph and answer these questions:

(a) How many customers chose the sit-down restaurant?

(b) 44 customers choose one type of service. What did they choose?

(c) What did most of the customers choose? How many customers chose this service?

(d) What was the least popular choice? How many customers made this choice?

http://academic.sun.ac.za/mathed/malati/3PrimDat.pdf

B: Value Based Activities:

Teacher introduces the need of each topic. Whether as a student

- 1. Have taken responsibility of the following topics?
- 2. Could their actions in the school be considered fair & justified concerning the topic mentioned?
- 3. Will students be able to take a right decision after doing a simple research on the topics mentioned?

Research study: Teacher shall give a topic for research where students do survey or interview on the assigned task with responsibility and find out justice & fairness is done and suggest a solution to solve the problem and give a presentation in the class/ assembly

Topic - I: Save electricity in school

Topic II Save water in school

Topic III keeping the school clean

Topic IV Maintain discipline in school

Teacher shall give clear instructions and guide the steps to be followed

- Introduction Significance of the topic
- Samples: 25 students from std (II-VI) 5 students from each class
- Method-Survey (Questionnaire/Interview, assist students to prepare questions)
- Organise data collected by using tally marks
- Represent the data by using bar graph
- Present to the class/assembly(PPT) & Submit Report to teacher
- Provide Recommendations and solutions based on research conducted.

These activities inculcate responsibility, discipline, fairness, decision making & honesty, cleanliness confidence among students.

V. C: Assignments

C1: Prepare slogans/posters for the school premises for the research topics (Save Electricity, Save Water, Clean School, Disciplined school)

Resources

References:

- 1. http://academic.sun.ac.za/mathed/malati/3PrimDat.pdf
- 2. Ncert Textbook, Reference books,(R.D Sharma , R.S.Aggarwal)



Topic	Values / Life skills integrated & imbibed	Activities
Simple Equations	Core Values considered : Equality, Balance& Responsibility	Value integration Activities:- 1.Discussion& solving riddles.
	Other Sub-harmony, time management, kindness, peace, calmness, respect, equanimity. Life skills: critical thinking, logical reasoning, &	 2. Discussion and Q&A method 3.Guiding students to do an activity which make them to realise their responsibility towards balancing environment and balancing themselves in adverse conditions
	computing.	4. Assignment: 1.Organise an activity in school to lead a successful& Balanced Life

Materials / Resources needed

Value Integration:-

- 1. Mats for meditation
- 2. Facilities and Equipment to show videos and space for conducting activities
- 3. BB, Pen, Duster
- 4. Ncert Text Book, Reference books, (R.D Sharma , R.S.Aggarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities, stories and games are incorporated in such a manner that students realise Everything under the sun focuses on a balance. Even when the balance shifts to one side while you are cycling, you are likely to fall. It is mainly because the equilibrium shifts as one loses balance causing one to fall. This is applicable in mathematical equations as well. Just like how an equation must be balanced our life too requires some balancing. To maintain equilibrium and balance in one's life, one must be willing to be flexible, disciplined and have the will power to compromise on things now to reap benefits later.

The key discussions are:

1.By doing a discussion solving riddles, teacher shall revise the previous knowledge of students in a fun way and making them to think out of the box

2. By discussion and Q&A method teacher demonstrate the secrets to lead a successful & balanced life

3.Guiding students to do an activity which make them to realise their responsibility towards balancing environment and balancing themselves in adverse conditions

4. Assignment:

1.Organise an activity in school to lead a successful& Balanced Life

<u>Unit 4</u>

<u>Simple Equations</u> Equality, Balance & Responsibility

I. Introduction

A mathematical equation which represents the relationship of two expressions on either side of the sign is called simple equation. An equation is a condition on a variable. The condition is that two expressions should have equal value. Note that at least one of the two expressions must contain the variable. An equation remains the same, when the expressions on the left and on the right are interchanged.

Everything under the sun focuses on a balance. Even when the balance shifts to one side while you are cycling, you are likely to fall. It is mainly because the equilibrium shifts as one loses balance causing one to fall. This is applicable in mathematical equations as well. Just like how an equation must be balanced our life too requires some balancing. To maintain equilibrium and balance in one's life, one must be willing to be flexible, disciplined and have the will power to compromise on things now to reap benefits later.

II. Learning Objectives / Outcomes

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

- Solve an equation.
- Transposing a term from one side to the other.
- Applications of Simple Equations
- Calculates the variability in real life situation and appreciate the variation observed in real life situations.
- Translates a real-life situation in the form of a simple algebraic equation in order to arrive at a generalized problem and solution by maintaining equality& responsibility to bring balance and lead a peaceful life.

Equation is said to be like a weighing balance. Doing a mathematical operation on an equation is like adding weights to or removing weights from the pans of a weighing balance. To maintain balance and lead a peaceful and harmonious life equality & flexibility are two important factors whether it is study & play, eating habits & health, work & family. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Equality, Balance & Respect along with other subvalues like harmony, time management, kindness, peace, calmness, respect, equanimity.

The unit also provides the scope to develop the following life skills in the students: critical thinking, logical reasoning, & computing.

IV. Activities & Related Discussion

A: Context activity for the Teacher to Start

A: The context activity for the teacher to start

A1: Those who love to challenge their problem-solving skills can try out these Math Riddles. Logic Puzzles and Riddles can be great to enhance kids learning abilities and math problem-solving skills ability.

- 1. Add the number to the number itself and then multiply by 4. Again divide the number by 8 and you will get the same number once more. Which is that number? **Answer: Any number**
- 2. At the time of shipping, Tom can place 10 small boxes or 8 large boxes into a carton. A total of 96 boxes were sent in one shipment. The number of small boxes was less than large boxes. What is the total number of cartons he shipped? Answer: 11 cartons

4 small boxes (4*10 = 40 boxes),7 large boxes (7*8 = 56 boxes) So 96 boxes and 11 total cartons

- 3. If you buy a rooster for the purpose of laying eggs and you expect to get three eggs each day for breakfast, how many eggs will you have after three weeks? Answer: Zero, roosters do not lay eggs
- 4. I am a three-digit number. My second digit is 4 times bigger than the third digit. My first digit is 3 less than my second digit. Who am I? **Answer: 141**
- A mobile phone and its case cost Rs. 110 in total. The price of the mobile phone is Rs.100 more than its case. What is the price of the mobile phone? Answer: Rs. 105 (not Rs.110)
- 6. If you multiply this number by any other number, the answer will always be the same.

What number is this? Answer: Zero

- 7. You are given a telephone and asked to multiply all the numbers on the device's number pad. What will be the answer? **Answer: Zero** (As the number pad contains number 0, When you multiply any number by zero, the answer will be zero).
- 8. How can you add eight 4s together so that the total adds up to 500? Answer: 444 + 44 + 4 + 4 + 4 = 500
- **9.** Teacher shall give opportunity to students come with more riddles so that class will be fun and slowly teacher shall introduce the topic equation.

Math Riddles Over here will not just challenge your kids' lateral thinking but also tests their logical thinking. These Simple and Funny Brain Teasers can be of great fun for your kids. Children will have so much fun and come up with out of the box and creative solutions.

Ref: https://www.learncbse.in/math-riddles-for-kids-with-answers/

B: Value Based Activities:

B1: Teacher shall discuss with students regarding the meaning of balance in life.

- 1. Do you get angry very fast?
- 2. Do you feel sleepy all the time?
- 3. Do you like to eat all the time/or do you lose appetite?
- 4. Do you forget thing often?
- 5. Do you feel tired or no interest in doing things like study, play etc.
- 6. You are glued to your phone
- 7. You are unclear about your priorities.
- 8. You strive for perfection.

These are some of the symptoms you are not balanced. Now teacher shall discuss with them how to overcome such situations. The secrets to lead a successful & balanced life we need to follow certain secrets.

1. Healthy eating habits and good exercise: Teacher shall discuss with students and make them aware that eating junk food (burger, Pizza, salty wafers, cool drinks etc) frequently is harmful. Researches proved that this lead to imbalance in emotions like getting angry very fast, not able to concentrate in studies, not able to remember things etc and feel sleepy all the time. Therefore eating healthy food, home cooked food is important and at the same time, playing or doing exercise outdoor is important instead of watching TV or playing game in mobile or computer.

2. Relationship with relatives, friends & family: Family ties are the tightest relationships you should have in your life. Relation with your grand parents, siblings, relatives' cousins, friends etc. are very important. They all are truly part of support

network. They will be always there when we will have bad time, as life is a mixture of good & bad. Having people around you that you like and trust is one of the best indicators of living a happy and long life.

3. Helping others: Helping people who are in need is giving a good satisfaction. Volunteering service to the community or society is very important because you are always rewarded by the act of giving. You all should help a blind person to cross the road, teach students of lower classes to clear doubts, help classmates to whenever they need support.

4. Being spiritual: Being spiritual also an aspect of living a balanced life. This can be praying every day for the goodwill of everyone in the world.one should yoga-breathing exercise, meditation frequently. These two habits renew ourselves when we are down. Whenever you feel low make time to rethink your connection to God, nature and all near & dear ones, you will feel refreshed and ready to face the world with a balanced mind.

B2. Teacher shall guide students to do meditation activity in the class

This teacher shall begin with a silent sitting exercise in which the pupils were asked to visualize a village, which was at first surrounded by trees, but which changed as the trees were cut down and was eventually destroyed by a flood because there were no trees to protect the soil. The children were asked to think for a moment about, "What can I do right now to prevent this problem?" and what they had learned from reflecting on this scene. This will help them to realize that everyone has a responsibility to the environment and that it cannot be left it to the others. The theme of balancing the environment was used to lead into the topic of balancing equations. It could also be related to balance in them, i.e. keeping themselves peaceful even when things go wrong, and how they can get back into balance if they feel disturbed or bothered by something.

It helps them to understand that even individuals can make a difference to the world, and that each one of us has the responsibility to do whatever we can. Balanced people are those who cope equally with things that flatter and things that hurt them they accept praise and criticism equally, they treat friends and enemies the same, they are not affected by events that happen around them that are either happy or sad.

Ref:http://www.ssehv.org/files/03-06en/Values%20in%20Math%20Topics.pdf

Teacher shall ask students to do a study on the above topics and do a presentation for the class after dividing the class in to four groups. Through these activity students will learn by themselves and learn from their peer group, which will have lasting impact on the importance of balancing life.

V.C:Assignments

C1: Guide students to plan & organise an activity in school groupwise according to their presentation project.

Resources

References:

- 1. https://www.learncbse.in/math-riddles-for-kids-with-answers/
- 2. https://www.learncbse.in/math-riddles-for-kids-with-answers/
- 3. Ncert Textbook, Reference books, (R.D Sharma, R.S.Aggarwal)



Topic	Values / Life skills integrated & imbibe	d Activities
Lines& Angles	Core Values considered : Interconnectedness and Inter-relationship	Value integration Activities:- 1.Solution of different worksheets in the class room
	Other Sub- inter- dependence, happiness, discipline	2 Video display and discussion on the topic interconnectedness
	Life skills: drawing, accuracy, observation, logical reasoning &	3. Group discussion& activity of interdependence& inter -relationship
	deduction.	4 Presentation by students on the topic interdependence & inter connectedness
		3.Assignment:
		C1:Collect quotes on interdependence/interconnectedness and display in school bulletin board
		C2:Drawings of Interconnectedness& interdependence as per students Imagination

Materials / Resources needed

Value Integration:-

- 1. Facilities and Equipment to show videos.
- 2. NCERT Text books, reference books (R.D. Sharma, R.S Agarwal)
- 3. Pen, board, Duster.

Description (of the points of discussion)

Value Integration:-

In this chapter the activities are incorporated to encourage students to learn the importance of relationship, interconnectedness and interdependence while teaching this lesson. Geometry is used to describe the relationship of figures and objects to the space around them. Lines are a series of points that continue in both directions. When two lines intersect they are many cases of formation of angles like perpendicular, complimentary, supplementary, vertically opposite etc. Here teacher shall explain to students regarding inter connectedness and interrelationships and its significance in life.

The key discussions are:

1.By solving different worksheets teacher shall revise their knowledge regarding basics concepts of geometry.

2.By showing video and discussion teacher elicit the interconnectedness between tree, nature& human being

3.By group discussion& activity teacher inculcate the significance of interdependence& inter -relationship

4 Presentation by students teacher inculcate the significance of interdependence & inter connectedness

3.Assignment:

C1:Collect quotes on interdependence/interconnectedness and display in school bulletin board

C2:Drawings of Interconnectedness& interdependence as per students Imagination

<u>Unit 5</u>

Lines & Angles

Inter-connectedness & Inter-relationship

I. Introduction

Geometry is used to describe the relationship of figures and objects to the space around them. Lines are a series of points that continue in both directions. When two lines lie on a two dimensional or flat surface, they are either parallel or they intersect. Parallel lines never meet or intersect. They remain equal distance apart no matter how far they are extended. Intersecting lines share a common point, or vertex, where they cross, this forms angles. When two lines intersect they are many cases of formation of angles like perpendicular, complimentary, supplementary, vertically opposite etc. Here teacher shall explain to students regarding inter connectedness and interrelationships and its significance in life.

II. Learning Objectives / Outcomes

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

- · Able to draw, identify, and define different types of angles and lines.
- · Identify and apply the properties of lines and angles.
- Understand the concept of parallel, perpendicular, complementary and supplementary angles, vertical angles, and parallel lines cut by a transversal.
- · Learn the significance of inter connectedness and interrelationships in life.

III. Process & Action Plan

Geometry concepts require the understanding and use of precise terms. Engage students in a discussion of lines and angles in their lives. The horizon, an aerial view of the city, the proportions and shape of a desk, chair or door are the some of the examples of geometry. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher is the character education of the students using the academic content at hand.

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



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* – <u>Knowing, Understanding, Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Inter-connectedness & Inter-relationship along with other sub-values like inter-dependence, happiness, discipline

The unit also provides the scope to develop the following life skills in the students: *drawing, accuracy, observation, logical reasoning & deduction.*

IV. Activities & Related Discussion

A: Context Activity for the teacher to start:

A1: Tick Mark the correct option in each question



A2: Different angles are hidden in these pictures. Identify the angles

- Right angles: 90 degree angle between two perpendicular lines
- Acute angles: Less than 90 degree but more than 0
- Obtuse angles: Greater than 90 degree but less than 180 degree



A3: Identify and Name the angle by writing right, acute, or obtuse on the line



https://www.education.com/lesson-plan/angles-and-lines/ https://www.turtlediary.com/worksheet/identify-point-line-ray-and-linesegment.html

B: Value Based Activities

B1:https://www.youtube.com/watch?v=Zn9SE2wp-T4

Teacher shall ask students what they have learnt from the video? Clear relation / Inter-connectedness between the tree/nature and human being.

B2: The Effects of Human Interdependence & Globalization

Think about the products you use

- 1. Mobile phones-many mobile phones design is made in America parts are made in Korea, china & japan, assembled in India
- 2. Computer/Laptop-many components are imported from Taiwan, china and assembled in India
- 3. Shoes-Chennai, Ludhiana, and Jalandhar are famous for making shoes; it is exported to different countries
- 4. Clothes-Indian formal clothes like Raymond's have high demand in most of the foreign countries.

We live in an interconnected world and countries economics are linked with each other. We have access to products from many places and locally produced goods are often exported. It is only by developing new connections and nurturing existing ones can we grow and flourish into better human beings.

Human Interdependence:

Consider the flour industry- one person specialises in growing crops, another on milling, one on packing, distributing and finally selling it. They need each other to deliver the final product, and if one day the mill stops, everyone is affected: they are all interdependent. Nowadays, most countries are also interdependent because they rely on other countries for supplying local demand and for selling local products.

This interdependence is strong, and one nation's actions often have consequences on another's. For example, China's labour costs impact employment in other countries, Russia's policies on gas affects transport costs in Europe, and air pollution generated in the United States has global effects.

From these examples and explanation teacher shall instill the significance of Interconnectedness/inter-dependence.

B3: Teacher shall divide students into groups and ask them to prepare presentation on interconnectedness/Interdependence on any topic of their choice to the class.

V.C:Assignments

C1: Prepare quotes on Interconnectedness/Inter dependence for display in bulletin boards of school.

C2: Drawings of Interconnectedness& interdependence as per students Imagination

Resources

References:

- 1. https://www.youtube.com/watch?v=Zn9SE2wp-T4
- 2. https://www.education.com/lesson-plan/angles-and-lines/
- 3. https://www.turtlediary.com/worksheet/identify-point-line-ray-and-line-segment.html



Values / Life skills integrated & imbibed	Activities
Core Values considered : Resilience, Aesthetics & Curiosity	Value integration Activities:- 1. Discussion in the class room and by solving worksheets
Other Sub-Values: confidence, beauty.	2. Solution of triangle puzzle instil curiosity among students
Life skills: drawing, logical reasoning, critical thinking, problem solving, creativity.	3. drawing/colouring activity to inculcate the value of creativity, aesthetic & beauty
	4. Assignment:
	Teacher instruct students and give assignment
	1. Study on the use of Triangle as the base any construction & prepare a report
	 Values / Life skills integrated & imbibed Core Values considered : Resilience, Aesthetics & Curiosity Other Sub-Values: confidence, beauty. Life skills: drawing, logical reasoning, critical thinking, problem solving, creativity.

Materials / Resources needed

Value Integration:-

- 1. Worksheets of puzzles
- 2. Facilities and Equipment to show videos and for conducting activities
- 3. BB, Pen
- 4. Ncert Text Book, Reference books,(R.D Sharma , R.S.Aggarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities and games are incorporated in such a manner that students learn triangles possess a number of key advantages that make them ideal for both architects and curious students: these shapes are incredibly common, structurally sound, and easy to apply and use in everyday life. The strength of a triangle derives from its shape, which spreads forces equally between its three sides. No matter what type of triangle is used in a structure (isosceles, scalene, or equilateral), triangles are stable, as they are inherently rigid, the three sides mutually reinforcing each other. The triangle is the strongest base for construction, through this lesson students learn the value of curiosity and importance of having the right foundation to face the challenges in life and experience the beauty/aesthetics of life.

The key discussions are:

1.By doing discussion in the class room and by solving worksheets teacher shall revise the previous knowledge of students

2.By doing for triangle puzzle teacher shall instil curiosity among students

3. By conducting drawing/colouring activity teacher shall inculcate the value of creativity, aesthetic& beauty among students

4. Assignment:

Teacher instruct students and give assignment

1. Study on the use of Triangle as the base any construction & prepare a report

<u>Unit 6</u>

<u>The Triangles and its Properties</u> Resilience, Aesthetics & Curiosity

I. Introduction

A triangle is a closed three-sided, three-angled figure, and is the simplest example of polygons (figures having many sides). Triangles possess a number of key advantages that make them ideal for both architects and curious students: these shapes are incredibly common, structurally sound, and easy to apply and use in everyday life. The strength of a triangle derives from its shape, which spreads forces equally between its three sides. No matter what type of triangle is used in a structure (isosceles, scalene, or equilateral), triangles are stable, as they are inherently rigid, the three sides mutually reinforcing each other. One of the most recognized geometric shapes is the triangle. The two most common triangular forms used in architecture are equilateral and isosceles. The triangle is the strongest base for construction, through this lesson students learn the value of curiosity and importance of having the right foundation to face the challenges in life and experience the beauty/aesthetics of life.

II. Learning Objectives / Outcomes

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

- Identifying the properties triangle by the sides and angles.
- Identify and classify the types of triangle by length of the sides & by the size of the angle.
- Describe median & altitude of a triangle and identify it for the given triangle
- Apply the exterior angle property of a triangle and find the measure of the unknown angle in the given triangle.
- Apply the angle sum property of a triangle and find the measure of unknown angle.
- Use appropriate property and determine the measure of the unknown angle(s) in the given figure.
- Apply the property of lengths of sides of a triangle and determine whether a triangle is possible for the given side lengths or not.

- Apply the Pythagoras property and verify whether the triangle for the given side lengths will be right angled triangle or not.
- Use appropriate properties and defend whether the given triangle is possible or not.

III. Process & Action Plan

Triangles are among the most important objects studied in mathematics owing to the rich mathematical theory built up around them in Euclidean geometry and trigonometry, and also to their applicability in such areas as astronomy, architecture, engineering, physics, navigation, and surveying. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and Acting</u> the values embedded in the topic.

The core values being considered are Resilience, Aesthetics & Curiosity along with other sub-values like confidence, beauty.

The unit also provides the scope to develop the following life skills in the students: *drawing, logical reasoning, critical thinking, problem solving, creativity.*

IV. Activities & Related Discussion

A: The context Activity for the Teacher to Start:

A1: Identify the following triangles as (Scalene, isosceles or equilateral triangle) and Fill in the blanks


A2: Classify the triangles by their sides and angles (Such us Isosceles, obtuse)

14		16.
24.	26	26.
314	32.	36

https://www.mathinenglish.com/worksheetview.php?id=256&stid=190015

https://www.homeschoolmath.net/worksheets/grade5/PDFs/Classify_Triangles_By _Sides_Angles_2.pdf

B: Value Based Activity:

B1: Four Triangle Puzzle

If you cut a square diagonally from corner to corner you get four right-angled isosceles triangles.



How many different shapes can you make by fitting the four triangles back together?

When looking at these solutions, we are assuming that the learners were able to communicate their curiosity in a written form that was understandable by another without any verbal interpretation from the learner themselves. In the classroom we are likely to find out much more about curiosity and problem-posing and problem-solving skills by listening to our learners' talk through the problem as they work.

Solution - 1



It is a triangle. It has 3 sides. 2 triangles together made a square and then we put this on the other two triangles and it made a larger triangle. To develop question-posing skills, and support the progress to the next level, Teacher might encourage students to ask questions. Students become more curious by realising that other learners have found more than one solution.

Solution-2 Teacher shall ask students to work in pair and find more solutions



Curious learners who keep exploring until they had found all possible answers. Their work and accompanying notes highlight their resilience; they use the method of trial and error until there were no more possible combinations apart from mirror images which would not count as a separate shape.

Here students become effective problem-solvers, but they are not necessarily problem-posers. Some of their learners working on this activity become curious about knowing the mathematical names for their shapes, and the subsequent conversations often lead to the learners wondering about regular and irregular shapes as they attempt to refine their vocabulary.

Solution - 3

Another useful strategy for stimulating curiosity, and especially problem-posing, simply requires encouraging learners to alter one aspect of the original problem. For the Four Triangles Puzzle, students could also be encouraged to reflect on their approach towards solving the problem, perhaps by asking them to suggest a hint for another learner struggling with a similar problem.



Ref: https://nrich.maths.org/14368

Some learners might display different levels of curiosity for different strands of the mathematics curriculum; some learners are more likely to be curious about shapes, measures and statistics rather than number and algebra. You may find that some learners hold negative attitudes towards number and algebra which possibly hinder their willingness to engage with problem-solving and problem-posing activities. Believe that well designed resources can begin to oversome such hurdles. More specifically, find that 'wow' moment, choosing low threshold high ceiling activities will support the development of more curious learners.

B2: Conduct a Drawing/Coloring activity aesthetics & beauty of collage of triangles.



Ref: https://www.pinterest.com.au/pin/155374255871143562/

This activity will instill creativity among students and instill beauty and aesthetic value of geometry and specifically triangles.

This will also help students increase their focus as artistic creativity puts one in a deep state of flow. Flow is the state of mind where one is completely immersed in the activity at hand, during such states people are not easily distracted.

By encouraging students to perform activities that cultivates this state of flow, teacher can help students increase the duration for which students can concentrate. This is like training a muscle and requires practice to develop this capability.

V. C: Assignments

C1: Study on the use of Triangle as the strongest base for construction& prepare a report

Resources

References:

1.https://www.pinterest.com.au/pin/155374255871143562/

2 https://nrich.maths.org/14368.

3. https://www.mathinenglish.com/worksheetview.php?id=256&stid=190015

4.https://www.homeschoolmath.net/worksheets/grade5/PDFs/Classify_Triangles_B

y_Sides_Angles_2.pdf

5. Ncert Textbook, Reference books, (R.D Sharma , R.S.Aggarwal)



Topic	Values / Life skills integrated & imbibed	Activities
Congruence of Triangles	 Core Values considered : Accuracy, Precision Other Sub-Values: stability, strength, beauty, aesthetics value Life skills: Creativity, problem solving, logical reasoning. 	 Value integration Activities:- 1Discussion with students with examples of daily life 2. By demonstration of pictures and discussion of academics teacher connect with real life and shall elicit & explain to students how precision & accuracy are important traits of personality 5. Assignment: Research work& presentation on use of triangular structure to reinforce strength & influence of accuracy of precision

Materials / Resources needed

Value Integration:-

- 1. Pictures of Giant where/,Pyramids. Truss Bridge, light house, Geodesic Dome, Twin Building
- 2. Facilities and Equipment to show videos & conducting games
- 3. BB, Pen
- 4. Ncert Text Book, Reference books, (R.D Sharma, R.S. Aggarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities and games are incorporated in such a manner that children learn the importance of accuracy and precision while learning triangle and its congruence for a stable and strong foundation. Geometry and architecture are two disciplines that are fundamentally linked. One of the most recognized geometric shapes is the triangle. Triangles are identified by the three angles that are linked through line segments to form a three-sided shape. The two most common triangular forms used in architecture are equilateral and isosceles.

The key discussions are:

1 By discussing with students with examples of daily life teacher shall revise previous knowledge of students.

2. By demonstration of pictures and discussion of academics teacher connect with real life and shall elicit & explain to students how precision & accuracy are important traits of personality

5. Assignment:

Research work& presentation on use of triangular structure to reinforce strength & influence of accuracy of precision

Grade VII

<u>Unit 7</u>

<u>Congruence of Triangles</u> Accuracy & Precision

I. Introduction

Geometric thinking and spatial reasoning play a critical role in geometry; shapes and figures provide powerful ways to represent mathematical situations and to express generalizations about space and spatial relationships the student uses congruencies to explore attributes of geometric figures and to make conjectures about geometric relationships. The student makes and verifies conjectures about angles, lines, polygons, circles, and three-dimensional figures, choosing from a variety of approaches such as coordinate, transformational, or axiomatic. In the real world congruent triangles are used in construction when we need to reinforce structures so that they are strong and stable, and do not bend or buckle in strong winds or when under load. Students learn the importance of accuracy and precision while learning triangle and its congruence for a stable and strong foundation. Geometry and architecture are two disciplines that are fundamentally linked. One of the most recognized geometric shapes is the triangle. Triangles are identified by the three angles that are linked through line segments to form a three-sided shape. The two most common triangular forms used in architecture are equilateral and isosceles.

II. Learning Objectives / Outcomes

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

- Experiment superposition of different figures (Line segments, Angles, & Triangles) and verify congruence of corresponding two figures
- Use SSS, SAS, and ASA & RHS Congruence criterion and examine whether the given triangles are congruent or not.
- Use any appropriate criterion of congruency and check whether the given triangles are congruent or not.
- Realise a strong and stable foundation needs accuracy and precision
- Gain self-confidence and optimism while learning integers
- Understand the concept of being righteous while choosing the path of life journey.

Students use geometric thinking to understand mathematical concepts and the relationships among them. Triangles are effective tools for architecture and are used in the design of buildings and other structures as they provide strength and stability. When building materials are used to form a triangle, the design has a heavy base and the pinnacle on the top is capable of handling weight because of how the energy is distributed throughout the triangle. This is why many residential homes have A-frames; it provides a sturdy structure. The sturdiest of the triangles are equilateral and isosceles; their symmetry aids in distributing weight. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Accuracy & Precision along with other sub-values like stability, strength, beauty, aesthetics value

The unit also provides the scope to develop the following life skills in the students: *Creativity, problem solving, logical reasoning.*

IV. Activities & Related Discussion

A: The context Activity for the Teacher to Start

A1:Teacher shall discuss about the concept congruence by quoting the example of the photocopy machine. When we put an A4 page inside the machine and activate it, you get an identical copy of that page. If you rotate or flip the page, it will remain the same as the original page. Even if you cut them out, you can line them up again easily. We can say the pages are similar or congruent.

Teacher shall ask students regarding real life examples of congruent objects which they see or observe in daily life.

- A pack of biscuits which has all biscuits of the same size and shape, if they are not broken
- Earrings of the same set.
- Cigarettes in a pack.
- Wheels of a bicycle.
- Pages of a particular book.
- Little fingers of both hands, Other fingers and thumbs are also congruent.
- Many of body organs, like kidneys and lungs are congruent.
- Even if a body is cut vertically from the centre into two halves, both halves are congruent.

B: Value Based Activities:

B1: Giant Wheel:



Teacher shall start off by giving students a picture of a Giant wheel and having them find as many triangles in that Giant wheel that have what seem to be the same sides and angles.

Ask the following questions.

- 1. What would happen if the giant wheel could be constructed without the idea of congruence?
- 2. What would happen if the giant wheel could be constructed without the idea of triangular shape?
- 3. If the shapes of triangles were different sizes, would the giant wheel work properly?

Teacher shall use this as a basis of what students need the idea of congruence to do their job.

B2: Truss Bridge:



The picture indicates multiple equilateral triangles. This compilation of equilateral triangles has created what is known as a truss bridge. **These triangles are all congruent by SSS because the point of a truss bridge is to have equal, weight controlling lengths** to keep the structure up and keep it from falling down. A truss bridge is a real world example of SSS congruency triangles.

B3:Light House:



The first lesson pertained to a multitude of types of triangles and properties of these triangles along with angle relationships. The picture indicates a right triangle. This is a real world example of how the **correct, exact angle** must be formed in order to give the boat substantial lighting to keep going. This is very important as many ships get shipwrecked at night because they lose the ability to see at night. However, by using angle relationships in triangles to coordinate the angle of the lighthouse light to the ship, this will be avoided as much as possible.

B4:Geodesic Dome:



The third lesson portrayed an elaboration on the ways to prove triangles congruent and congruent triangles. The picture to the left indicates a piece of common playground

equipment. This is a real world example of how the necessary angles and side lengths must be created and that they must be congruent to the other triangles. This is very important as many children play on these contraptions and one **miscalculation in terms of angle** or side length or congruence to the other triangles could be fatal to a child. However, by using angle relationships in triangles to have the plentitude of isosceles triangles be congruent by ASS, this will have a much lower chance to occur

B5: Buildings:



The two identical buildings where two triangles on the front-facing faces of the buildings are both congruent! By utilizing congruent triangles the buildings create a nice work atmosphere (office buildings), a protection system from the sun by reflecting off opposite triangular faces, or even a popular tourist attraction. This is an example of triangle congruence in the real world which gives aesthetic value & stability to the identical building.

B6:Pyramids-Equilateral Triangle



The equilateral triangle is by far the most common triangle used in architecture. An equilateral triangle features three congruent sides and angles measuring 60 degrees on each corner. The lengths of the sides vary. A common example of equilateral triangles used in architecture is the Pyramid Complex of Giza in Egypt. Each of the four triangular sides that form the pyramids are equilateral triangles. These are examples of the strength of the triangle in architecture as the pyramids have been standing for over 4,000 years.

Teacher shall explain to students that how precision & accuracy are important characteristic traits that one should develop as part of building one's core personality. This acts as a strong foundation for one to build on as one navigates through the various challenges of life.

https://squarepis.weebly.com/real-world-relevance3.html https://sciencing.com/triangles-used-in-architecture-12084289.html

V.C: Assignments

C1: Study on structures where the concept of congruence of triangles used to reinforce strength and prepare a presentation for the class where accuracy & precision is utmost important.

Resources

References:

- 1. https://squarepis.weebly.com/real-world-relevance3.html
- 2. https://sciencing.com/triangles-used-in-architecture-12084289.html
- 3. Ncert Textbook, Reference books, (R.D Sharma, R.S.Aggarwal)
- 4. https://meangreenmath.com/2013/11/12/engaging-students-congruence



Topic	Values / Life skills integrated & imbibed	Activities
Comparing Quantities	Core Values considered : Relationship, Accuracy& Beauty	Value integration Activities:- 1.Solving worksheets in the class room& discussion teacher shall revise their previous knowledge of students.
	Other Sub-Values: aesthetics, happiness, healthy living, and peace	2.Discussion of different relationships and organising group discussion teacher
	Life skills: observation, computing, problem solving,	3. Discussion with students regarding golden ratio &the relationship between accuracy and proportion
		5.Assignments Report submission after study on application of golden ratio and its relation with beauty on different areas.

Materials / Resources needed

Value Integration:-

- 1. Work sheet to conduct context activity& Picture of Mona Lisa painting by Leonardo da Vinci
- 2. Facilities and Equipment to show videos
- 3. Pen, Board, Duster
- 4. NCERT Text Book, Reference books, (R.D Sharma, R.S. Aggarwal)

Value Integration:-

In this chapter the activities are incorporated in such a manner that children learn comparison between two or more like quantities in the same units. Proportion describes the relationship between the dimensions of different elements and an overall composition and relationships between height, width and depth. The proportions of a composition will affect how pleasing it looks and can be used to draw our attention to particular areas. The use of proportion is essential for creating accurate images. Understanding and using correct proportion in life drawing and portraits allows an artist to create well-balanced, realistic representations of the human form. While learning concepts of ratio and proportion students will learn the concepts of unitary method. Percentage, and simple interest, profit & loss and how they can apply in practical life. This lesson teaches the importance of relationship, beauty & accuracy.

The key discussions are:

1.By solving worksheets in the class room& discussion teacher shall revise their previous knowledge of students.

2.By discussion of different relationships and organising group discussion teacher inculcate the value of healthy & happy relationships to live happy forever

3.By discussion with students regarding golden ratio teacher shall encourage students to observe, appreciate the relationship between accuracy and proportion by citing examples

5.Assignments

Report submission after study on application of golden ratio and its relation with beauty on different areas.

Grade VII

<u>Unit 8</u>

<u>Comparing Quantities</u> Relationship, Accuracy& Beauty

I. Introduction

A ratio is a comparison between two or more like quantities in the same units. Proportion describes the relationship between the dimensions of different elements and an overall composition and relationships between height, width and depth. The proportions of a composition will affect how pleasing it looks and can be used to draw our attention to particular areas. The use of proportion is essential for creating accurate images. Understanding and using correct proportion in life drawing and portraits allows an artist to create well-balanced, realistic representations of the human form. While learning concepts of ratio and proportion students will learn the concepts of unitary method. Percentage, and simple interest, profit & loss and how they can apply in practical life. This lesson teaches the importance of relationship, beauty & accuracy.

II. Learning Objectives / Outcomes

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

- Learn the concept of ratio and find the ratio between two like quantities.
- Understand the concept of proportion & check if two ratios are in proportion or not.
- Understand the concept of increase or decrease percent.
- Understand the concept of discount and simple interest and find the simple interest of a given amount
- Learn the significance of relationship while learning ratio and beauty and accuracy while learning proportion.
- Understand the concept of being righteous while choosing the path of life journey.

III. Process & Action Plan

The ratio and proportion are the two important concepts, and it is the foundation to understand the various concepts in mathematics as well as in science. In our daily life, we use the concept of ratio and proportion such as in business while dealing with money or while cooking any dish, etc. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Relationship, Accuracy & Beauty along with other sub-values like aesthetics, happiness, healthy living, and peace.

The unit also provides the scope to develop the following life skills in the students: *observation, computing, problem solving,*

IV. Activities & Related Discussion

A: the context Activity for the teacher to start:





A2: Reduce the ration into its lowest terms

1)	16:8	-	 2)	5:15	-	°
3)	15:30	-	 40	7:21	-	
5)	12:18	-	 63	8:20	-	
n	3:15	-	 80	4:24	-	87
9)	6:14	-	 10)	11:22	-	

A3: Find the missing number in the following proportions



https://www.mathworksheets4kids.com/ratio/customary/part-to-part-level1-1.pdf https://in.pinterest.com/pin/315814992613666680/

1)	3:2 = a:8	2)	c:7 = 18:14	3)	5:4 = 20:d
	<i>a</i> =		c =		<i>d</i> =
4)	2: <i>b</i> = 12:24	5)	8:3 = n:9	6)	9:27 = u:3
	b =		n =		ы =

B: Value Based Activity:

B1: Importance of Relationship

Teacher shall discuss with students as in ratio & proportion they have studied about relation between quantities for comparison or composition. The same is applicable in life. To have a happy, healthy, and long life, people need to have happy and healthy relationships. These relationships are absolutely necessary for any of us to survive, learn, work, love, and procreate. Human relationships take many forms but the most intense, most pleasurable and most painful are those relationships with family, friends and loved ones. The positive relation keeps one happy and peaceful. Let's see what a relation is?

Relationship is when two or more people bond together based on mutual trust, love, care and connection. Now teacher shall ask the following questions and elicit answers from students.

1. Name different types of relationships.

- 2. What are the pillars of any successful relationships?
- 3. Why people need healthy relationships?

After hearing different answers from student's teacher shall summarize and give meaningful answers to them

Answers:

1. Human relationships take many forms but the most intense, most pleasurable and most painful are those relationships with family, friends and loved ones. These important relationships not only include family and personal friends but also the wider groups and communities we belong to. Forming connections and a sense of community with colleagues, neighbours and the various groups that make up our identity (such as sports, hobbies, religious and community groups), all contribute to our well-being.

• Family relationship is based on blood or kinship. It is always good to have a nice relationship with your family because you can gain trust and you know that they are always there for you.

• **Friendship** is based on mutual likes and dislikes. Friends are different than your parents because there are just some things you do not do with your parents. You can talk to your friend's different, act different, and do activities that you do not do with your family.

• Acquaintances are ones you know or meet daily but are neither your friends nor family. Relationships give you the chance to interact with the people. In our day to day lives, we encounter a lot of people that pass by. They are neither friends nor relatives. They can be neighbours, a travel companion, someone you meet at the park, or any other such person. But if such a relationship is treated with respect and care, it can grow to friendship in the future.

2. The healthy and successful relationship is based on four pillars. They are communication, trust, respect, and love.

- Communication in a relationship is important to share your feelings and build trust as well
- Respect in any kind of relationship is important. As said, if you give respect you get respect.
- Relationships need trust, love & attention to survive and grow strong.

3. Human is a part of society. To have a happy, healthy, and long lives, people need to have happy and healthy relationships. Relationships take time to create and when they grow strong they are forever and you can claim you are in a position of happily ever after'.

Teacher shall further divide students into groups and ask them how they can make these relationships healthy and organize a group discussion in the class by giving different relationship topic.

Ref: https://www.aplustopper.com/essay-on-relationship

B2: Relationship of Beauty in Accurate Proportion



Teacher shall discuss with students and make them observe, appreciate the relationship between accuracy and proportion by citing examples

1. The Mathematics of Beauty and the Golden Ratio

Observing beauty in objects and people, early mathematicians detected what seemed to be a pattern. This is what is called the "Golden Ratio" symbolized by the Greek letter Φ which has a constant value of Phi=1.618. Leonardo da Vinci used the ratio to define symmetry in structures, including the human body in which it is aesthetically pleasing to the

human eye. In Da Vinci's study it is the proportion of the measurements of a person's body parts in relation to another body part.

The golden ratio is not just observed in people, but is actually used in architecture and art work as well. It is also observed in flower petals, seashells and sunflower seeds. In the Great Pyramid of Giza, the length of one side of the base is 756 feet with a height of 481 feet. The ratio of the base to the height is roughly 1.5717 (756/481) which is close to the Golden ratio. It is also seen in art like the Mona Lisa painting by Leonardo da Vinci.

The Mona Lisa painting by Leonardo da Vinci exhibits features of the golden ratio (Source Wikimedia)

Teacher shall ask students to do a study on application of golden ratio and its relation with beauty and submit a report.

Ref: https://medium.com/hd-pro/the-mathematics-of-beauty-and-the-golden-ratio-156b948c3d1a

V. C: Assignments

C1: Study on application of golden ratio and its relation with beauty on different areas and submit a report.

Resources

References:

1. https://medium.com/hd-pro/the-mathematics-of-beauty-and-the-golden-ratio-156b948c3d1a

2. https://www.aplustopper.com/essay-on-relationship

https://www.mathworksheets4kids.com/ratio/customary/part-to-part-level1-1.pdf https://in.pinterest.com/pin/315814992613666680/



Topic	Values / Life skills integrated & imbibed	Activities	
Rational Numbers	Core Values considered : Inclusivity & diversity Other Sub-Values: equality,	Value integration Activities:- 1.Discussion & worksheets of puzzles teacher shall revise the previous knowledge of students.	
	Life skills: computing, problem solving, critical thinking, observation	2Discussion , explanation and guiding students to brainstorm the advantages & promotion of Inclusivity in the class room by group discussion	
		3Discussion , explanation and guiding students to brainstorm the advantages & promotion of diversity in the class room by group discussion & presentation	
		4. Assignment Prepare Posters with Quotes and pictures for school bulletin board.	

Materials / Resources needed

Value Integration:-

- 1. Work Sheets to conduct context activity
- 2. Facilities and Equipment to show videos
- 3. BB, Pen, Duster
- 4. Ncert Text Book, Reference books,(R.D Sharma , R.S. Aggarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities and games are incorporated in such a manner that children learn the concept of rational numbers along with their addition, subtraction, multiplication and division operations. A rational number is a number that is expressed as the ratio of two integers, where the denominator should not be equal to zero. Rational numbers include all types of numbers which students have studied like natural numbers, whole numbers, integers, decimals & fractions. Through rational numbers teacher shall teach inclusivity and diversity. By the inclusion of fractions in integers it becomes rational numbers which solve many problems in mathematics & real life. Similarly, it gives diversity of applications as it contains all type of numbers.

The key discussions are:

1.Bydiscussion & worksheets of puzzles teacher shall revise the previous knowledge of students.

2...By discussion, explanation and guiding students to brainstorm the advantages & promotion of Inclusivity in the class room by group discussion teacher shall inculcate in students the importance of inclusivity in the classroom

3..By discussion, explanation and guiding students to brainstorm the advantages & promotion of diversity in the class room by group discussion & presentation teacher shall inculcate in students the importance of diversity.

4. Assignment

Prepare Posters with Quotes and pictures for school bulletin board

<u>Unit 9</u> <u>Rational Numbers</u> Inclusivity & diversity

I. Introduction

The lesson Rational Numbers is an extension of the number system further. We shall introduce the concept of rational numbers along with their addition, subtraction, multiplication and division operations. A rational number is a number that is expressed as the ratio of two integers, where the denominator should not be equal to zero. Rational numbers include all types of numbers which students have studied like natural numbers, whole numbers, integers, decimals & fractions. Through rational numbers teacher shall teach inclusivity and diversity. By the inclusion of fractions in integers it becomes rational numbers which solve many problems in mathematics & real life. Similarly, it gives diversity of applications as it contains all type of numbers.

II. Learning Objectives / Outcomes

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

- Define rational numbers and classify a number as a rational number
- Represent integers in the form of numerator /denominator where denominator is non-zero
- Multiply numerator and denominator by same non-zero integer and find equivalent rational numbers
- Define positive and negative rational numbers and classify a number as either of them
- Construct a number line and represent rational numbers on it
- Simplify rational number such that there is no common factor between numerator and denominator and represent the number in standard form.
- Determine the distance of a rational number from 0 and compare them
- Calculate and find rational numbers between any two rational numbers and infer that there are infinite rational numbers between any two given rational numbers.
- Apply the rules of rational numbers operations and simplify arithmetic operations
- Applies appropriate mathematical operations on rational numbers in order to solve problems related to daily life situations.

Rational numbers are not just important as abstractions in the realm of Mathematics but also can model the real world in ways important for everyday decisionmaking. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and Acting</u> the values embedded in the topic.

The core values being considered are Inclusivity & diversity along with other sub-values like equality, cooperation & teamwork.

The unit also provides the scope to develop the following life skills in the students: *computing, problem solving, critical thinking, observation*

IV. Activities & Related Discussion

A: The context Activity for the Teacher to start:

A1: Fill in the Blanks



A2: Fill the missing number (Numbers in the circles add up the number in the linking rectangle)



https://twitter.com/team_maths1/status/964946955196620801 https://www.apost.com/ https://www.pinterest.ca/pin/321514860872393722/

B. Value Based Activities:

B1: Inclusivity in Class room:

Teacher shall explain the meaning of inclusivity as we include decimals & fraction in integers how the applications & facilities are widened, similarly when we accept or include all types of people, the situation changes and we learn from them. Successful inclusion is a must inside the classroom. When pupils are included properly, they will equally have the same chance to achieve, learn and acquire new experiences inside their school. The classroom is built upon interaction, cooperation, group work, and participation. These can be done through inclusion. If there is exclusion, teaching process would not be successful. Inclusion is one of the key elements of education which, if applied properly, can help a school achieve success. Inclusion lexically means the act of including or the state of being included. Inclusion is about equal opportunities for all pupils. Pupils should all be included regardless of their age, gender, ethnicity, attainment and background. It gives attention and concentration to all pupils.

After explanation about inclusion teacher shall divide students into groups and ask them to prepare advantage of inclusion in the class room and suggestion to promote inclusion by group discussion.

B2: Diversity

Teacher shall explain the meaning of diversity which is there in rational numbers and the same thing is applicable in real life. Diversity is the state of being diverse or having a large variety. Diversity means understanding that individuals are unique or different in a particular way, leaning to accept and live with people from varied backgrounds. Interacting with people from different, religious beliefs, races, ethnicity, sexual orientation, socio-economic status, age, gender, physical abilities, political beliefs, or other ideologies. Diversity promotes celebration, ability to effectively handle barriers, balance of individuality and group identity, encourages collaboration and innovation, improves appreciation of one's own culture, interaction and networking. School will be a place where people meet and make new friends.

After explanation about Diversity teacher shall divide students into groups and ask them to prepare a presentation on the advantages of diversity in the classroom by indulging in group discussions.

V.C:Assignments

C1: Prepare Posters with quotes and pictures for school bulletin board

Resources

References:

- 1.https://www.ukessays.com/essays/education/
- 2. https://twitter.com/team_maths1/status/964946955196620801
- 3.https://www.apost.com/
- 4.https://www.pinterest.ca/pin/321514860872393722/n-essay.php
- 5. Ncert Textbook, Reference books, (R.D Sharma, R.S.Aggarwal)



Topic	Values / Life skills integrated & imbibed	Activities
Practical Geometry	Core Values considered : Precision, Accuracy & Beauty	Value integration Activities:- 1.Solve worksheets to revise students' previous knowledge and prepare them for the new topic practical geometry
	Other Sub-Values: aesthetics, creativity Life skills: drawing, logical thinking& reasoning, measuring, observation.	 Encourage students by asking different questions, teacher elicit different instances where parallel lines are used in real life ty Encourage students by asking different questions, teacher elicit different instances where triangles are used in real life
		4.Assignment Prepare picture album where triangle and parallel lines are used to make the structure strong, stable and beautiful and compare it with human life

Materials / Resources needed

Value Integration:-

- 1. Facilities and Equipment to show videos
- 2. BB, Pen
- 3. Ncert Text Book, Reference books,(R.D Sharma , R.S. Aggarwal)
- 4. Worksheets for doing context activity & pictures of pyramids, rails, metal book elves.

Description (of the points of discussion)

Value Integration:-

In this chapter the activities and games are incorporated in such a manner that children learn construction of geometrical objects or practical geometry is an important branch of geometry. There are specific ways and rules for construction of parallel lines and triangles. While learning practical geometry and doing constructions students learn the significance of beauty and precision. When we construct anything with precision and accuracy it will be long lasting, stable & beautiful. Triangles are effective tools for architecture and are used in the design of buildings and other structures as they provide strength and stability. The triangle's use in architecture dates back more years than other common architecture shapes such as the dome, arch, cylinder, and even predates the wheel.

The key discussions are:

1.By solving worksheets teacher revise students previous knowledge and prepare them for the new topic practical geometry

2.By encouraging and asking students different questions, teacher elicit different instances where parallel lines are used in real life teacher make students experience the significance of precision, accuracy& beauty

3.By encouraging and asking students different questions, teacher elicit different instances where triangles are used in real life teacher make students experience the significance of precision, accuracy, stability& beauty

4.Assignment

Prepare picture album where triangle and parallel lines are used to make the structure strong, stable and beautiful and compare it with human life.

<u>Unit 10</u>

Practical Geometry

Precision, Accuracy & Aesthetics

I. Introduction

Construction of geometrical objects or practical geometry is an important branch of geometry. This chapter discuss about construction of parallel lines and triangles. There are specific ways and rules for construction of parallel lines and triangles. While learning practical geometry and doing constructions students learn the significance of beauty and precision. When we construct anything with precision and accuracy it will be long lasting, stable &beautiful. Triangles are effective tools for architecture and are used in the design of buildings and other structures as they provide strength and stability. The triangle's use in architecture dates back more years than other common architecture shapes such as the dome, arch, cylinder, and even predates the wheel.

II. Learning Objectives / Outcomes

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

- Ability to Construct line parallel to given line, though a point not on the line
- Ability to list and execute steps and construct a triangle given the measures of its three sides, any of its two lengths and an angle between them, any of its two angles and the side included between them is given.
- List and execute steps and construct a right-angled triangle when the length of one leg and its hypotenuse are given
- Realise that parallel lines & triangles used in real life applications for strength and stability
- · Importance of precision and accuracy in all activities give aesthetics & stability.

Parallel lines rule the construction industry. Buildings are erected with walls parallel to each other, ceilings are parallel to floors, and one building is usually put up parallel to other buildings on the same block. Notebook paper is a thick collection of parallel lines. Truss bridges have supporting structures constructed in triangular shapes. Triangles are used in supporting the structure of the bridges because they evenly distribute the weight without changing the proportions. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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


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 Precision, Accuracy & Beauty along with other sub-values like strength, stability, relationship.

The unit also provides the scope to develop the following life skills in the students: drawing, observation, critical thinking, and teamwork.

IV. Activities & Related Discussion

A: The Context activity for the teacher to start

A1: Choose the correct answer

1. How many medians a triangle can have?

(a) 2

(b) 1

(c) 3

(d) 0

2. A/an connect a vertex of a triangle to the mid point of the opposite side.

(a) altitude

(b) median

(c) vertex

(d) none of these

3. How many altitude can a triangle have?

(a) 1

(b) 2

(c) 3

(d) 4

Find the value of x in the adjoining figure.

(a) 50° (b) 70°

(c) 120°

(d) 180°

70

5. Find the value of x (a) 60° (b) 110° (c) 50° (d) 180°

6. A triangle in which two sides are of equal lengths is called

- (a) Equilateral
- (b) Isosceles
- (c) Scalene
- (d) Acute angled triangle

7. In the Pythagoras property, the triangle must be

- (a) acute angled
- (b) right angled
- (c) obtuse angled
- (d) none of these

8. Find the value of x in this figure.

- (a) 40°
- (b) 60°
- (c) 35°
- (d) 180°

- 9. Find the value'of x in given figure.
- (a) 180° (b) 55°
- (c) 90°
- (d) 60°

120

10. A triangle in which all three sides are of equal lengths is called

- (a) Equilateral
- (b) Isosceles
- (c) Scalene
- (d) Acute angled triangle

11. \triangle ABC is right-angled at C. If AC = 5 cm and BC = 12 cm find the length of AB.

- (a) 7 cm
- (b) 17cm

12. The hypotenuse of a right triangle is 17 cm long. If one of the remaining two sides is 8 cm in length, then the length of the other side is.

(a) 15cm

(b) 12 cm

(c) 13 cm

(d) none of these

A2:

Find the value of x an y:

1. Here CD || AB











https://www.worksheetsbuddy.com/grade-7-the-triangle-and-its-properties-worksheets/

B: Value Based Activities

B1: Teacher shall ask students to list five instances where parallel lines are used in real life.

1. Zebra crossing on the road.

- 2. Road and railway crossing.
- 3. Railway tracks with sleepers.
- 4. Wind screen wiper in cars.
- 5. Staircase and the railings.

Allow students to brainstorm and find the scientific reason behind the above examples, by dividing them in groups and then they will write an explanation of the best and easiest way to ensure that these lines truly are parallel and will see how the mathematical concepts apply to real world situations.

Teacher shall insist that students specifically think and express in terms of importance of application of precision, which give stability and beauty in any work. Then teacher shall explain how important it is for each student to assimilate the quality of precision. One should always strive to incorporate the value of precision while doing any work, this will ensure that the work that they have done is accurate, beautiful and not prone to errors. Furthermore, it will students joy, satisfaction and pride in their work.

B2: Teacher shall ask students to list five instances where Tringles are used in real life

https://www.youtube.com/watch?v=1K3A8aJfGX0

- 1. Traffic Signs. Traffic signs form the most commonly found examples of the triangle in our everyday life. ...
- 2. Wings of airplane.
- Truss Bridges. Truss bridges have supporting structures constructed in triangular shapes....
- 4. Roof. The roofs of the houses are made in the triangle shape.
- 5. Pyramids in ancient Egypt
- 6. Eiffel Tower

Allow students to brainstorm and find scientific reasons behind above examples, by dividing them in groups and then they will write an explanation of the best and easiest way to ensure that how the mathematical concepts of triangles apply to real world situations. Teacher shall insist them specifically think and express in terms of importance of application of precision, which give stability and beauty in any work. Then teacher shall explain how important each one of the student to assimilate the quality of precision in them while doing any work which give them stability& beauty and satisfaction.

Teacher shall explain some more combination examples by using presentation/picture

Look at a set of metal bookshelves, the type that are a bunch of horizontal metal shelves and four vertical legs?

You will often see a diagonal piece that connects one point on one leg to a different point on a second leg, a diagonal line connecting the two legs. You can see two transverse pieces on this set of shelves. This set of shelves is much less likely to fall over because of those pieces. This is because the transverse pieces can complete a triangle between one shelf and two legs. A triangle is harder to deform. (In this image, they form "almost a triangle", but the strength is still improved by the transversal.)



Students will be able to identify parallel lines versus skew lines, will be able to discuss the properties of parallel lines cut by a transversal, and will be able to find examples of parallel lines in the real world and discuss how and why they are parallel and will be able to create their own parallel lines using multiple strategies.

Triangles are effective tools for architecture and are used in the design of buildings and other structures as they provide strength and stability. ... The triangle's use in architecture dates back more years than other common architecture shapes such as the dome, arch, cylinder, and even predates the wheel. Triangles are used in bridges because they evenly distribute weight without changing their proportions.

https://trianglesrock.weebly.com/applications-of-triangles.html

Teacher shall explain to students that just like a triangle balances each side to form a sound sturcture, one should also strive to maintain a balance in all their relationships to have a happy and stable life.

The relationship between parent-teacher and student is the most beautiful tiangular relation, the strength and mutually complimenting teach pattern ensures that the students is able to handle all situations in life and come out of each one having achieved success.

The relationship between father-mother and child is another example of a beautiful triangular relation which sets the foundation of a childs persoanility.

• The precise measures of tiangle annd parallel lines ensures a strong foundation, similarly every one should strive to make the their own foundations strong.

V. C: Assignments

C1: Prepare picture album where triangle and parallel lines are used to make the structure strong, stable and beautiful and compare it with human life.

Resources

References:

- 1. Ncert Textbook, Reference books, (R.D Sharma, R.S.Aggarwal)
- 2. https://trianglesrock.weebly.com/applications-of-triangles.html
- 3. :https://www.youtube.com/watch?v=1K3A8aJfGX0



Topic	Values / Life skills integrated & imbibed	Activities
Perimeter & Area	Core Values considered: Self-awareness & Self- Control	Value integration Activities:- 1.Worksheets are used for revision and test the previous knowledge of students.
	Other Sub-Values: patience, helping others, forgiveness, mindfulness, caring	2.Discussion on self-control and its benefits and how to make it a habit in their daily life.
	Life skills: computing, observation, critical thinking, logical reasoning, leadership, listening	3.Discussion on self-awareness and its benefits and how to make it a habit in their daily life.
		4.Assignment: Prepare posters of self -control & Self- awareness with pictures & write ups

Materials / Resources needed

Value Integration:-

- 1. BB, Pen, board, Duster.
- 2. Worksheets to conduct context activity
- 3. Facilities and Equipment to show videos& presentations
- 4. NCERT Text books, reference books (R.D. Sharma, R.S Agarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities and games are incorporated to help children in learn that real-life utility of the concept is in several fields such as mapping, architecture, and surveying. The geometric representation of figures is done by sketching the distances and areas for clear understanding. Students learn about measurement of boundary and area of geometrical figures as it is not supposed to cross the limits. Through this lesson the teacher shall inculcate in students that they should always set a boundary and space for them. Boundary/perimeter means a control and discipline in every walk of their life and the space, the amount of surface in a closed figure means one should know about oneself, i.e. self-awareness.

Self-control is a complex skill that is developed over time. It allows one to slow down and think through their actions. Self-control helps us to resist temptation and avoid conforming to the things that may be considered as morally ambiguous.

The key discussions are:

1. Worksheets are used for revision and test the previous knowledge of students.

2.By discussion teacher instil self-control and its benefits and how to make it a habit in their daily life.

3.By discussion teacher instil self-awareness and its benefits and how to make it a habit in their daily life.

4.Assignment:

Prepare posters of self -control & Self-awareness with pictures & write ups

<u>Unit 11</u> <u>Perimeter& Area</u> Self-Control

I. Introduction

The area is the region covered by shape or figure whereas perimeter is the distance covered by outer boundary of the shape. The concepts of area and perimeter are the basis for understanding Euclidean geometry and calculating the volume of solid shapes in 3-dimensional space such as cones, prism, sphere, and cylinder. Also, we use these formulas for calculating the area and perimeter for quadrilaterals and polygons comprising of sides and curves. The real-life utility of the concept is in several fields such as mapping, architecture, and surveying. The geometric representation of figures is done by sketching the distances and areas for clear understanding. Students learn about measurement of boundary and area of geometrical figures as it is not supposed to cross the limits. Through this lesson the teacher shall inculcate in students that they should always set a boundary and space for them. Boundary/perimeter means a control and discipline in every walk of their life and the space, the amount of surface in a closed figure means one should know about oneself, i.e. self-awareness.

Self-control is a complex skill that is developed over time. It allows one to slow down and think through their actions. Self-control helps us to resist temptation and avoid conforming to the things that may be considered as morally ambiguous.

II. Learning Objectives / Outcomes

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

- Describe the area and perimeter of plane figures and find the same for square and rectangle Learn that increase in perimeter of a plane figure does not always mean that area will also increase. Use unit square grid sheets and determine the perimeter and area square and rectangles
- Apply a formula and determine the area of triangle as half of the area of a rectangle. Recall the concept of congruent figures and generalize the area of congruent parts of rectangles.

- Use unit square grid sheets and find the perimeter and estimate the area of parallelogram. Develop and apply a formula and determine the area of a parallelogram. Compare the area of a triangle and its corresponding parallelogram and discuss their relation
- Use direct or indirect measurements and describe the relationships among radius, diameter, and circumference of circles. Investigate different circumference of circles and compare them with their respective diameter and relate circumference to Pi. Use direct or indirect methods to find the circumference of circle, semicircle. Develop and apply the formula and find the area of a circle and semicircle.
- Convert units and measure area or perimeter in other units. Examine area and perimeter of different figures and find solution for real life problems.
- · Learn self-control and self-awareness and its benefits in life.

III. Process & Action Plan

Area & perimeter unknowingly we apply in daily life. Floor covering, like carpets and tiles, require area measurements.. Fabric used for clothing and other items also demand that length and width be considered. For any kind of gardening around a structure, you need to measure the inside perimeter. If your are redecorating your home, then area is useful to determine how much paint or wallpaper to buy. Perimeter is useful if you are buying trim for the windows or molding for the walls. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing, Understanding, Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Self Control Self-Awareness along with other subvalues like patience, helping others, forgiveness, mindfulness, caring

The unit also provides the scope to develop the following life skills in the students: *computing, observation, critical thinking, logical reasoning, leadership, listening*

IV. Activities & Related Discussion

1. Context Activity For the teacher to start:



https://www.math-salamanders.com/area-worksheets.html https://www.homeschoolmath.net/worksheets/area_perimeter_rectangles.php

B: Value Based Activities:

B1: How to build Self Control and benefits of Self Control

Teacher shall discuss with students about self-control and its benefits and how to make it a habit in their daily life.

Teacher asks different questions and elicit the meaning of self-control from students and summaries it

Self-control is the ability to regulate and alter your responses in order to avoid undesirable behaviors, increase desirable ones, and achieve long-term goals. Research has shown that mastering self-control can be important for one's health and well-being. People who practice self-control can engage in things to keep themselves healthy and happy. It is an ability to manage and monitor one's emotions, behaviors, and desires in the instances of external demands when you are in a group or society.

Then teacher shall instill 10 habits by discussing with students and citing examples.

10 habits of self-controlled people.

- Avoid Temptation:
- Set Boundaries....
- Prioritize Things....
- Measure Progress....
- Forgive Yourself
- Commit to yourself be true to your word. ...
- Pray, Meditate, Be Mindful (Prayer and meditation are powerful ways to help you reset your thought processes which lead with your Mind Over Their Mood...
- Take Care of Themselves....
- Work at Developing Habits
- Clearly Define their Goals.

Self-control is the most essential element of character. Without it, no character is possible. All true growth implies restraint. In Sanskrit books, the human body is compared to a chariot, the five senses or the horses are not kept under restraint, and they will run away with the driver and throw him into a pit. These five senses should, therefore he kept in check. The mind of man is very restless. Unless it is controlled, it will lead him astray. All evil passions, all evil thoughts should be driven out; we should not give a loose rein to our feelings and impulses. We must check and suppress anger, 'count ten,' says a proverb. The pages from the history show that the people who had self-control made their marks and got their aims. For true progress, it is important to have self-control.

https://www.thecollegestudy.net/2019/03/short-paragraph-on-self-control.html

B2:Self-Awareness& benefits of Self Awareness

Teacher shall discuss with students about self-awareness and its benefits and how to make it a habit in their daily life. Teacher asks different questions and elicit the meaning of self-awareness from students and summaries it

Self-awareness is important because when we have a better understanding of ourselves, we are able to experience ourselves as unique and separate individuals. We are then empowered to make changes and to build on our areas of strength as well as identify areas where we would like to make improvements. Becoming more self-aware is the first step in many aspects of personal growth. That's where the benefits of self-awareness come in – it allows you to see yourself more clearly.

Then teacher shall instill 10 benefits by discussing with students and citing examples.

- More empathy toward others:
- Better listening Skills
- Improved critical thinking skills
- Better leadership skills
- Better self-Control
- Better creativity
- Better decision-making skills
- Increased ability to change Habits
- Higher self esteem
- Better overall perspective

There are many benefits of self-awareness. It helps you have more empathy for others and enables you to be a better listener. This, in turn, helps to build up your relationship with others. When you cultivate self-awareness, you need feedback from others and you realize your own strengths and weaknesses. All the feedback and reflection gives you a better overall perspective, more self-confidence, and self-esteem, and boosts your critical thinking and creative abilities. It also enables you to change your habits more easily, make better decisions and have more self-control. All these things boost your leadership ability and make you a person that others want to work for and follow because they feel valued and appreciated.

Ref: https://contentmentquesting.com/benefits-of-self-awareness/

V. C:Assignments

C1: Prepare posters of self -control & Self-awareness with pictures & write ups

Resources

References:

- 1.https://contentmentquesting.com/benefits-of-self-awareness/
- 2. https://www.thecollegestudy.net/2019/03/short-paragraph-on-self-control.html
- 3. https://www.math-salamanders.com/area-worksheets.html
- 4. https://www.homeschoolmath.net/worksheets/area_perimeter_rectangles.php
- 5. Ncert Textbook, Reference books, (R.D Sharma , R.S.Aggarwal)



Topic	Values / Life skills integrated & imbibed	Activities
Ratio and Proportion	Core Values considered : Interconnectedness & Interdependence Other Sub-Values: unity, relationship Togetherness,	Value integration Activities:- 1. Puzzles and cross word problems to revise the previous knowledge of students. 2. Video display & discussion with students, relate to real life situations of
	equality, diversity, team work Life skills: observation, critical thinking, problem solving, computing, cooperation	eco system and learn the consequences and solution 3 Discussion & brief description group wise topics and ask them to explore further and make presentations how inter connectedness help to become global citizens.
		4.Assignment: 1:Report submission on study of interdependence & inter connectedness in Ecosystem& Global system

Materials / Resources needed

Value Integration:-

- 1. Work sheet of puzzles & crosswords to conduct context activity
- 2. BB, Pen, scissor, colour pencils.
- 3. Facilities and Equipment to show videos.
- 4. NCERT Text books, reference books (R.D. Sharma, R.S Agarwal) pen, board, Duster

Description (of the points of discussion)

Value Integration:-

In this chapter the activities incorporated in such a way that while learning algebraic expressions students learn the importance of inter-connectedness and interdependence as when we connect two or more terms with addition, subtraction, multiplication, together it becomes an algebraic expression. Similarly when we connect or depend with other people or the community which give us a feel of unity & togetherness

The key discussions are:

1.By using puzzles and cross word problems teacher revise the previous knowledge of students.

2.By showing video & discussion with students teacher relate to real life situations of eco system and learn the consequences and solution

3.By discussion & brief description teacher shall give group wise topics and ask them to explore further and make presentations how inter connectedness help to become global citizens.

4.Assignment:

1:Report submission on study of interdependence & inter connectedness in Ecosystem& Global system

<u>Unit 12</u>

<u>Algebraic Expressions</u> Interconnectedness & Interdependence

I. Introduction

Algebra is a fascinating and essential part of mathematics. It provides the written language in which mathematical ideas are described. Expressions are central concept in Algebra. An algebraic expression in mathematics is an expression which is made up of variables and constants, along with algebraic operations We can also obtain expressions by connecting variables with themselves or with other variables by using addition, subtraction, multiplication and division. While teaching teacher shall instil interconnectedness and inter-dependence as when we connect two or more terms with addition, subtraction, multiplication, together it becomes an algebraic expression. Similarly when we connect or depend with other people or the community which give us a feel of unity & togetherness

II. Learning Objectives / Outcomes

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

- Describe algebraic expressions and distinguish them from arithmetic expressions. Combine variables and constants in order to form an algebraic expression for the given statement.
- Examine the algebraic factors of the given terms and distinguish between like and unlike terms. Classify them as monomial, binomial, trinomial, polynomial.
- Applies algebraic properties in order to Add & Subtract algebraic expressions and determine their sum & difference
- Use the given value of variable(s) and evaluate the algebraic expression and complete the table of number patterns or find its nth term. Examine the pattern and verify whether the given algebraic expression satisfies the shown pattern or not.
- Translates a real-life situation in the form of a simple algebraic equation in order to arrive at a generalized problem and solution for the situation
- · Learn interconnectedness and inter dependence for leading happiness

An algebraic expression is a combination of terms by the operations such as addition, subtraction, multiplication, division, etc. For example, let us have a look at the expression 5x + 7. Thus, we can say that 5x + 7 is an example of an algebraic expression. There are different components of an algebraic expression. Let us have a look at the image given below in order to understand the concept of Variables, Constants, Terms, and Coefficients of any algebraic expression



Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Interconnectedness & Interdependence along with other sub-values like unity, relationship Togetherness, equality, diversity, team work

The unit also provides the scope to develop the following life skills in the students: *observation, critical thinking, problem solving, computing, cooperation*

IV. Activities & Related Discussion



A: The context Activity for the teacher to start:

https://www.math-salamanders.com/math-puzzle-worksheets.html

B: Value Based Activity:

B1: Interdependence: https://www.youtube.com/watch?v=Yzwr4Kxfg9o

Teacher shall show the video of interdependence to the class and discuss in detail and register importance of interdependence of our eco system.

B2: Interconnectedness: help students to become global citizens

Technological advancement, climate change and global interconnectedness has changed the way we work and live together. Teacher shall encourage learners to explore into a range of important current affairs and technology issues, comprehend how to investigate across borders, understand different perspectives, address discrimination and human rights violations, and learn about the importance of sustainability. Above all, the curriculum encourages students to think globally and act locally, and develop those allimportant skills that help them think outside-the-box. Teacher shall give the following topics for them after dividing them into groups and with brief description.

- **1. Social justice and equality:** Discussion on this topic enables and encourages students to voice their concerns about unjust situations. It can also give rise to discussions around the need for equal treatment of individuals regardless of their race, gender, religion, sexuality, disability, and any other personal preferences or lifestyle choices.
- **2. Identity and diversity:** Discussion on this topic helps students raise their awareness of how diversity is dealt with around the world. It can also encourages them to discover their own identity and As they become more interconnected, their ability to understand and accept other cultures, races, religions, and values is incredibly improve.
- **3. Human rights:** Discussion on this topic encourages students to demand a world without discrimination, inequality and prejudice. In this topic, students are introduced to the fundamental laws and concepts that make up human rights, which promote individual and collective rights and freedoms. The aim is to make students aware of their own rights, and the rights of others around the world.
- **4. Sustainable development:** Discussion on this topic encourages students to work towards a more sustainable future. Climate change is one of the most pressing issues of time. Now is the time to come together to protect our planet and teaching learners to take action, and demand others do so, is essential.
- **5. Globalisation and interdependence:** We live in a world where we are connected with people from many different countries. Even though we live in one country, we also live in one world and we are connected to other countries in a whole range of ways. Globalization is the term used to describe the way people in different countries are becoming more and more interconnected economically, socially and politically.

Instruct students to work, discuss and brainstorm in groups and make presentation & report so that each one understand the significance of inter-connectedness & inter-dependence to become global citizens.

V.C:Assignments

C1: Submission of report on their study on inter-dependences & interconnectedness on Ecosystem& Global citizens.

Resources

References:

1.https://www.youtube.com/watch?v=Yzwr4Kxfg9o

2.https://www.math-salamanders.com/math-puzzle-worksheets.html

3. <u>https://blog.pearsoninternationalschools.com/teaching-students-to-become-global-citizens/</u>

4. Ncert Textbook, Reference books,(R.D Sharma , R.S.Aggarwal)



Topic	Values / Life skills integrated & imbibed	Activities
Exponents & Powers	Core Values considered : Hard work & Positive Attitude	Value integration Activities:- 1.Use Rubik's Cube ,discussions & solving problems
	Other Sub-Values: optimism, integrity, courage, confidence, determination, patience, calmness, and focus	2.Discussion with students regarding positive attitude and ask students to correlate it with real life situations & with other traits of character.
	Life skills: problem solving, logical thinking, concentration	3. Discussion & brief description narrate a story
		4.Assignment:
		1:Study on famous personalities who pursue the passion with hard work & positive attitude

Materials / Resources needed

Value Integration:-

- 1. Rubic Cube to conduct context activity
- 2. BB, Pen, scissor, colour pencils.
- 3. Facilities and Equipment to show videos & presentations
- 4. NCERT Text books, reference books (R.D. Sharma, R.S Agarwal) pen, board, Duster.

Description (of the points of discussion)

Value Integration:-

In this chapter the activities incorporated in such a way that students learn Exponents and Powers are ways, used to represent very large numbers or very small numbers in a simplified manner. The exponent is a simple but powerful tool. It tells us how many times a number should be multiplied by itself to get the desired result. One of the most common real world applications of exponents involves taking measurements and calculating multi-dimensional quantities. While teaching exponents teacher shall instil positive attitude& hard work among students. The more one has positive attitude and willingness to work hard the result will be like exponents and powers, it gives you multiple effects.

The key discussions are:

1.By using Rubik's Cube ,discussions & problems teacher revise and introduce the new topic to students.

2.By discussing with students regarding positive attitude and ask students to correlate it with real life situations & with other traits of character.

3.By discussion & brief description teacher narrate a story and teach students to appreciate hard work of everyone ,and how it is leading to success.

4.Assignment:

1:Study on famous personalities who pursue the passion with hard work & positive attitude

Grade VII

<u>Unit 13</u>

Exponents & powers Hard work & Positive Attitude

I. Introduction

An expression that represents repeated multiplication of the same factor is called a power. Exponents and powers are ways, used to represent very large numbers or very small numbers in a simplified manner. The exponent is a simple but powerful tool. It tells us how many times a number should be multiplied by itself to get the desired result. One of the most common real world applications of exponents involves taking measurements and calculating multi-dimensional quantities. While teaching exponents teacher shall instil positive attitude & hard work among students. The more one has positive attitude and willingness to work hard the result will be like exponents and powers, it gives you multiple effects.

II. Learning Objectives / Outcomes

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

- Describe exponential form of numbers and express numbers in exponential notation & identify its base and exponent.
- Examine the numbers given in exponential form, compare and represent them in an order, express them as the product of power of prime factors.
- Apply laws of exponents and simplify a given expression
- Write numbers using powers of 10 and express them in standard form, exponent form.
- Applies properties of exponential numbers in order to simplify problems involving multiplication and division of large numbers

Learn hard work and positive attitude give great power and success.

Exponential functions are so useful in real world situations. Another kind of indirect example of using exponents is when we talk about extremely tiny or extremely big quantities. The term "nanometer" means 10⁻⁹ meter. The prefix "nano" means the number 10⁻⁹, which is an extremely small decimal number (0.000000001). Very large numbers are difficult to read, understand and compare. To make these numbers easy to read, understand and compare, we use exponents. Exponents are used in Computer Game Physics, pH and Richter Measuring Scales, Science, Engineering, Economics, Accounting, Finance, and many other disciplines. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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



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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and</u> <u>Acting</u> the values embedded in the topic.

The core values being considered are Hardwork & Positive attitude along with other subvalues like optimism, integrity, courage, confidence, determination, patience, calmness, and focus.

The unit also provides the scope to develop the following life skills in the students: *problem solving, logical thinking, concentration*

IV. Activities & Related Discussion

A: The context Activity for the teacher to start:

A1: Teacher will show the student a Rubik's Cube.

Teacher will ask if anyone has ever tried to solve a Rubik's Cube. Tell the students that according to the manufacturer, there are 43 quintillion different possible moves on the Rubik's Cube. Show the number for 43 quintillion: 43,000,000,000,000,000,000 Teacher will discuss the problem of writing such large numbers and explain that there is a much simpler way to do it, and that is to use exponents, or scientific notation. The way to express 43 quintillion in scientific notation is 43×10 (with an exponent of 18). That means 10 multiplied by itself 18 times (i.e., 43×1018).

A2: Teacher shall ask the students to express the following using exponents

- 1. Mass of earth: 5,970,000,000,000,000,000,000 kg
- 2. Mass of Uranus: 86,800,000,000,000,000,000,000 kg.
- 3. Distance between Sun and Saturn is 1,433,500,000,000 m
- 4. Distance between Saturn and Uranus is 1, 439,000,000,000 m

B: Value Based Activities:

B1: Positive Attitude:

Teacher shall discuss with students regarding positive attitude and elicit different views and summaries

Positive attitude means being optimistic about situations, interactions, and yourself.
 People with positive attitudes can remain hopeful and see the best even in difficult situations

- Positive attitude helps you cope more easily with the daily affairs of life. It brings optimism into your life, and makes it easier to avoid worries and negative thinking. If you adopt it as a way of life, it would bring constructive changes into your life, and makes them happier, brighter and more successful.
- Positive people have more energy and are more self-confident and hopeful. Because of this they tend to set higher goals and expend more effort in order to reach their goals. ... This helps positive people see multiple solutions to problems and make better decisions
- There are ten specific behavioral traits that are characteristic of a positive-thinking and positive-living person: optimism, enthusiasm, belief, integrity, courage, confidence, determination, patience, calmness, and focus.

Teacher shall ask students to connect each trait with a positive attitude by means of a story or event.

B2: Hard work

Teacher shall discuss regarding hard work and its end result, summaries and narrate a story

- Hard work is one of the most important things in life as it helps us to be more confident. If you will work hard then you will be able to achieve all your goals and fulfill all your dreams.
- Working hard with full determination always pushes us one step ahead in life and helps us surpass our limitations.
- Hard work is the most important key to success. The achievements without hard work are impossible. An idle person can never gain anything if they sit and wait for the better opportunity to come. The person who is working hard can gain success and happiness in life.

Story for Narration-Value/Appreciate Hard work

One young academically excellent person went to apply for a managerial position in a big company. He passed the first interview; the director did the last interview, made the last decision. The director discovered from the CV that the youth's academic achievements were excellent all the way, from the secondary school until the postgraduate research, never had a year when he did not score.

The director asked, "Did you obtain any scholarships in school?" The youth answered "none".

The director asked, "Was it your father who paid for your school fees?" The youth answered, "My father passed away when I was one year old, it was my mother who paid for my school fees".

The director asked, "Where did your mother work?" The youth answered, "My mother worked as clothes cleaner. The director requested the youth to show his hands. The youth showed a pair of hands that were smooth and perfect".

The director asked, "Have you ever helped your mother wash the clothes before?" The youth answered, "Never, my mother always wanted me to study and read more books. Furthermore, my mother can wash clothes faster than me".

The director said, "I have a request. When you go back today, go and clean your mother's hands, and then see me tomorrow morning".

The youth felt that his chance of landing the job was high. When he went back, he happily requested his mother to let him clean her hands. His mother felt strange, happy but with mixed feelings, she showed her hands to the kid. The youth cleaned his mother's hands slowly. His tear fell as he did that. It was the first time he noticed that his mother's hands were so wrinkled, and there were so many bruises in her hands. Some bruises were so painful that his mother shivered when they were cleaned with water.

This was the first time the youth realized that it was this pair of hands that washed the clothes every day to enable him to pay the school fee. The bruises in the mother's hands were the price that the mother had to pay for his graduation, academic excellence and his future. After finishing the cleaning of his mother's hands, the youth quietly washed all the remaining clothes for his mother. That night, mother and son talked for a very long time. Next morning, the youth went to the director's office.

The Director noticed the tears in the youth's eyes, asked: "Can you tell me what have you done and learned yesterday in your house?" The youth answered, "I cleaned my mother's hand, and also finished cleaning all the remaining clothes".

The Director asked, "Please tell me your feelings". The youth said,

- 1. I know now what appreciation is. Without my mother, there would not the successful me today.
- 2. By working together and helping my mother, I realize how tough it is to get something done.
- 3. I have come to appreciate the importance and value of family relationship".

The director said, "This is what I am looking for to be my manager. I want to recruit a person who can appreciate the help of others, a person who knows the sufferings of others to get things done, and a person who would not put money as his only goal in life. You are hired". Later on, this young person worked very hard, and received the respect of his subordinates. Every employee worked diligently and as a team. The company's performance improved tremendously.

Moral/Discussion: If one doesn't understand and experience the difficulty it takes to earn the comfort provided by their loved ones, than they will never value it. The most important thing is to experience the difficulty and learn to value hard work behind all the

given comfort. Value your relationship. Try to understand the suffering of the person who loves you, cares for you and even dreams for you. https://www.moralstories.org/appreciation-of-hard-work/

V.C:Assignments

C1: Study on famous personalities who pursue the passion with hard work & positive attitude.

Resources

References:

- 1. https://www.moralstories.org/appreciation-of-hard-work/
- 2. Ncert Textbook, Reference books, (R.D Sharma, R.S.Aggarwal)



Торіс	Values / Life skills integrated & imbibed	Activities
Symmetry	Core Values considered : Equality ,Fairness& Balance Other Sub-Values: inclusivity, passion, hard work, integrity, diversity Life skills: observation, listening, presentation, communication, and drawing	 Value integration Activities:- 1.By by using presentation, discussion& activity teacher shall revise the previous knowledge of students. 2.By discussion and explanation of Mission Mangal: the real story of ISRO women behind India's mission to Mars 3.By conducting a study on the life & legacy of Dr.Ambedkar by students and presenting it in the class 4. Assignment Write an essay on how inclusivity in the life with the presention of the presen
		class room onng positive change

Materials / Resources needed

Value Integration:-

- 1. Pictures/PPT, Tracing Paper for the context activity
- 2. Facilities and Equipment to show videos
- 3. Facilities to conduct games
- 4. BB, Pen
- 5. Ncert Text Book, Reference books,(R.D Sharma , R.S. Aggarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities are incorporated in such a manner that children learn that symmetry is found everywhere in nature and is also one of the most prevalent themes in art, architecture, and design, in cultures all over the world and throughout human history. It is easily noticeable in various arts, buildings, and monuments. Symmetry is definitely one of the most powerful and pervasive concepts in mathematics

People who are treated fairly and are provided equal opportunity are better able to contribute socially and economically to the community, and to enhance growth and prosperity. Studies show that an equal and fair society will score higher on measures for happiness, satisfaction and safety. Through the topic Symmetry the teacher can inculcate the value of Equality, fairness & balance. Symmetry in everyday refers to a sense of harmonious and beautiful proportion and balance.

The key discussions are:

1.By by using presentation, discussion& activity teacher shall revise the previous knowledge of students.

2.By discussion and explanation of Mission Mangal: the real story of ISRO women behind India's mission to Mars explain the equal & fair treatment and support of family & colleagues, hard work .passion & integrity made mission mangal a huge success.

3.By conducting a study on the life & legacy of Dr.Ambedkar by students and presenting it in the class instil the significance of equality among students.

4. Assignment

Write an essay on how inclusivity in the class room bring positive change

<u>Unit 14</u>

<u>Symmetry</u> Equality, Fairness & Balance

I. Introduction

Symmetry is found everywhere in nature and is also one of the most prevalent themes in art, architecture, and design, in cultures all over the world and throughout human history. It is easily noticeable in various arts, buildings, and monuments. Symmetry is definitely one of the most powerful and pervasive concepts in mathematics

People who are treated fairly and are provided equal opportunity are better able to contribute socially and economically to the community, and to enhance growth and prosperity. Studies show that an equal and fair society will score higher on measures for happiness, satisfaction and safety. Through the topic Symmetry the teacher can inculcate the value of Equality, fairness & balance. Symmetry in everyday refers to a sense of harmonious and beautiful proportion and balance.

II. Learning Objectives / Outcomes

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

- Identify shapes that have a line of symmetry and regular polygons and they have multiple lines of symmetry
- Explain why or why not a shape has symmetry and able to draw lines of symmetry
- Recognize the three different types of symmetry: reflection, rotational, and point and able to find number and order of symmetry
- Realise the study of symmetry is important as its frequent use in day today life make life beautiful
- Incorporate the value of Equality, fairness & balance.
- Inculcate the value of **inclusivity** and its importance in ensuring harmony in relationships.

III. Process & Action Plan

Symmetry is something that we observe in many places in our daily lives without even noticing it. Symmetry is often seen every day by people of all ages in nature. Symmetry that we see every day in nature is most often bilateral Symmetry. This means that the two halves of an object are exactly mirror images of each other. The human face has a line of symmetry, but some faces are more symmetrical than others. The more symmetrical your face the prettier your face will appear. Nature uses symmetry to make things beautiful. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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


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* – <u>Knowing</u>, <u>Understanding</u>, <u>Valuing and Acting</u> the values embedded in the topic.

The core values being considered are Equality, Fairness & Balance along with other subvalues like inclusivity, passion, hard work, integrity, diversity

The unit also provides the scope to develop the following life skills in the students: *observation, listening, presentation, communication, and drawing.*

IV. Activities & Related Discussion

A: context activity for the teacher to start:

Teacher can introduce the topic by taking examples of Symmetry from, natural and manmade things which they have seen or heard from others. Teacher shall have a presentation or show pictures or concrete objects.

Symmetry in humans: Organs such as kidneys, lungs, and the brain are created symmetrically as part of evolution process. If you draw a line or slice these organs in half, you will have a mirror image of the other.

Symmetry in nature: In nature flowers there are roughly identical petals, sepals, stamens, and leaves. Butterfly

Symmetry in animals: At the beach there are a wide variety of shells and underwater life with a line of symmetry, an example of this is a crab, a lobster, octopus, and starfish.

Artificial Symmetry: Man made monuments Taj Mahal, Red fort.

Symmetry in humans



Symmetry in nature



Symmetry in leaves



Symmetry in vegetables



Symmetry in Nature& Animals, Birds



Symmetry in Architecture



Teacher shall ask students to find out the line where these pictures can be divided into two equal parts and introduce the line of symmetry. In order to make the concept clear, teacher can form groups of students and conduct activities such as trace a butterfly pattern (I usually have 4-5 different sizes) available. Once the students have their butterfly pattern cut out. They then decorate each side the exact same way. This is a great activity to show symmetry. Then display the butterflies for all to see or any other resources that will make the activity enjoyable.

B.Value based Activities:

Teacher can help students to promote Equality

Using the above examples of symmetry the teacher can emphasize on the value of equality in nature and how the same should be applied to our lives as well. The teacher should focus on the value of equality and inculcating the characteristic of treating all individuals as equals.

B1. Here the teacher can cite story of the strong women behind the success of Mission

Mangal, a Space program by ISRO. These women overcame several social barriers and challenges to catapult India and its Space program to International stardom. This was achieved by treating each individual as equal and without discrimination. (Click on the following link for full article -<u>Story</u>)

Mission Mangal: the real story of ISRO women behind India's mission to Mars (Gender Equality)

When the universe is your workspace, the sky is the limit, and there's no such thing as a glass ceiling. Here are the ladies behind Mangalyaan

Mangalyaan catapulted India's space programme to international stardom. In an









Moumita Dutta

Ritu Karidhal

Minal Rohit

Nandini Harinath

astonishing 15 months from the day it was announced (by the then-Prime Minister Manmohan Singh, in a speech on 15 August 2012), the team at ISRO conceptualised, planned and implemented the mission, successfully sending off the auto rickshaw-sized satellite out of Earth's orbit and into Mars', a journey of 660 million km and 300 days. Armed with five payloads, including a methane sensor and tri-color Mars Color Camera, the satellite cost a total of US\$70 million only. (For perspective, a similar NASA mission cost US\$671 million; and the Sandra Bullock film, Gravity, cost US\$100 million.) The amazing success of the mission brought worldwide attention and not a small dose of national pride and glory.

ISRO scientists like Moumita Dutta Ritu Karidhal, Minal Rohit & Nandini Harinath are worthy of queen status. The passion in their voices is palpable. Karidhal, Dutta, Nandini and Minal have all worked at ISRO for 10–20 years, and each calls it a "dream come true." "When you are working for a mission, for your country, whatever sacrifices you make seem worth it," says Dutta), but equally so to credit their cooperative colleagues, supportive husbands, encouraging parents (who never let them believe that girls were any different than boys, and continue to pitch in) and in-laws for pitching in to help with their kids. All the scientists are clear that ISRO (whether in Bengaluru or Ahmedabad) is a brilliant work environment. "Nobody cares if you're a man or woman here," says the soft-spoken Karidhal. "It's talent and good ideas that matter. There's equal opportunity." Women constitute only 20% of ISRO's 16,000-strong workforce, but female engineers are increasingly joining in. "There's greater awareness and education among young women now," says Nandini. "Parents are being supportive of their daughters pursuing careers. The problem is that many highly educated women drop out before reaching leadership positions. That's the mindset we need to change. Women must realize that they can manage having careers and families. It's possible! You can do it if you want to."

These are women who clearly derive great joy from their professions, and speak of their research as having higher goals, of helping solve many of our current problems. "Satellite data can be used in so many ways to benefit day-to-day living,"

Discussion:

- 1. Name the four strong women behind the Mangalyaan mission?
- 2. What factors did make them successful in their profession?
- 3. What is your opinion regarding women manage careers & families?

Teacher shall conclude that if there is fairness and equality women can balance careers and family very well and solve many of our current problems.

Ref:<u>https://www.cntraveller.in/story/mission-mangal-true-story-real-isro-women-who-powered-india-mission-to-mars-mangalyaan/</u>

B2: Dr Ambedkar's life and legacy, however, remains an inspiration for many who believe that caste hierarchy should cease to exist, and formation of an equal society is the way forward.



Teacher shall divide students in 3 groups ask students to do a study on his life and work and give a small presentation in the class

Group - I: life & education

Group-II: Struggle for equality

Group-III: Contributions for India

Teacher shall conclude by saying

The aim of equality and diversity is to ensure that everyone has the same opportunities and receive fair treatment.

Creating an inclusive culture for all students in class ensuring equal access to opportunities to enable students to participate in the learning process

Good equality and diversity practices make sure that the services provided to people are fair and accessible to everyone.

They ensure that people are treated as equals, that people get the dignity and respect they deserve and that their differences are celebrated. Teacher should emphasize that all humans, animals, plants nature are created equally to maintain a balance in our universe and therefore it is every individual's duty to treat others equally & fairly and without discrimination on any grounds.

Teacher can also explain about the beauty and dignity of people with disabilities and other challenges. Here the teacher can emphasize on the importance of inculcating an attitude of inclusivity. This helps students understand the value of every human being and also teaches them that we are all made in the image and likeness of God. Our value does not depend on our appearance, ability, or background.

Ref:https://yourstory.com/2016/04/bhimrao-ambedkar?utm_pageloadtype=scroll

V. C: Assignments

C1: Write an essay on how inclusivity in the class room bring positive change

Resources

References:

1.https://yourstory.com/2016/04/bhimrao-ambedkar?utm_pageloadtype=scroll 2.https://www.cntraveller.in/story/mission-mangal-true-story-real-isro-women-whopowered-india-mission-to-mars-mangalyaan/

3. Ncert Textbook, Reference books, (R.D Sharma , R.S.Aggarwal)



Торіс	Values / Life skills integrated & imbibed	Activities
Visualising Solid Shapes Shapes	Core Values considered : Equality& Perspective-Taking Other Sub Values: simplicity, respect. Life skills: Communication, Technological skills, Research skills, decision making, and high thinking.	 Value integration Activities:- 1. Discussion, display of images & concrete objects to revise the previous knowledge of students 2. Narration of an incident of Mrs Sudha Murty faced in real life & discussion 3. Assignment: Study on Mother Teresa and Mahatma Gandhi how simplicity and high thinking, equality decide the class not the possession of a huge amount of money, money does not buy you class.

Materials / Resources needed

Value Integration:-

- 1. Images and concrete -3D objects
- 2. Facilities and Equipment to show videos& presentation
- 3. BB, Pen
- 4. Ncert Text Book, Reference books,(R.D Sharma , R.S.Aggarwal)

Description (of the points of discussion)

Value Integration:-

In this chapter the activities are incorporated in such a manner that helps students to realise that a three-dimensional object or shape can look differently from different positions (or sides) so they can be drawn from different perspectives, this is called visualising a solid shape. In our day to day life, we see several objects like books, balls, ice-cream cones etc., around us which have different shapes. One thing common about most of these objects is that they all have some length, breadth and height or depth. This chapter gives us an insight that "Don't judge a book by its cover" means one shouldn't prejudge the worth or value of something by its outward appearance alone. One should not form an opinion on someone or something based purely on what is seen on the surface, because after taking a deeper look, the person or thing may be very different than what was expected. Perspective-taking is the act of perceiving a situation or understanding a concept from an alternative point of view

The key discussions are:

- 1. By discussion, display of images & concrete objects and by eliciting ,teacher shall revise the previous knowledge of students
- 2. By narrating an incident of Mrs Sudha Murty faced in real life & discussion teacher shall instil in students the quality of "Don't judge a book by its cover". An drive a message treat every one equally

3. Assignment:

Study on Mother Teresa and Mahatma Gandhi how simplicity and high thinking, equality decide the class not the possession of a huge amount of money, money does not buy you class.

<u>Unit 15</u> <u>Visualising Solid Shapes</u> Equality & Perspective-Taking

I. Introduction

A three-dimensional object or shape can look differently from different positions (or sides) so they can be drawn from different perspectives, this is called visualising a solid shape. In this chapter, you will classify figures in terms of dimension. In our day to day life, we see several objects like books, balls, ice-cream cones etc., around us which have different shapes. One thing common about most of these objects is that they all have some length, breadth and height or depth. That is, they all occupy space and have three dimensions. Hence, they are called three dimensional shapes. This chapter gives us an insight that "Don't judge a book by its cover" means one shouldn't prejudge the worth or value of something based purely on what is seen on the surface, because after taking a deeper look, the person or thing may be very different than what was expected. Perspective-taking is the act of perceiving a situation or understanding things from several angles or points of view.

II. Learning Objectives / Outcomes

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

- Discuss and give examples and differentiate between plane figures and solid shapes
- Examine different solid shapes and identify and count their number of faces, edges and vertices
- · Build nets of 3D shapes and understand their properties
- Examine oblique sketches and visualize all the faces of a solid shape
- Use isometric dot sheet and draw isometric sketches of a 3D shape.
- Draw 3D objects in 2D and visualize solid objects from different perspectives.
- Examine cross sections of different solid shapes and interpret and visualize different planes.
- Examine the different figures formed by changing the angle of shadows formed and visualize solid figures

- Examine solid figures from different angles and view different sections of solids.
- Learn perspective-taking & equality.

III. Process & Action Plan

A cube, rectangular prism, sphere, cone and cylinder are the basic 3-dimensional shapes we see around us. Solid shapes are nothing but solids that consist of 3 dimensions, namely length, breadth, and height. Solid shapes are also known as 3D shapes. These solid shapes occupy space and are found in our day-to-day life. We touch, feel, and use them. Your role as a teacher is significant, as you have the power and the means to shape the lives under your guidance. One of the most important goals you may have as a teacher, is the character education of the students using the academic content at hand.

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

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* – <u>Knowing, Understanding, Valuing and</u> <u>Acting the values embedded in the topic.</u>

The *core values* being considered are *equality* & *Perspective ta*long with other sub-values like students *simplicity, respect.*

The unit also provides the scope to develop the following life skills in the *Communication, Technological skills, Research skills, decision making, and high thinking.*

IV. Activities & Related Discussion

A:The context Activity for the teacher to Start

A1:Invite students for a scavenger hunt in the class room, allow students to work in partners or small groups to see how many solid figures they can find in the class room in five minutes. Ask students to list them in a paper and explain them its name and properties. Teacher shall recapitulate the previous knowledge by eliciting from students and explain to the class



- One-dimensional figures do not enclose any area and have only one direction. Example: A ray or a line segment.
- Two-dimensional figures have an area associated with them. They have length and breadth or width.

They are usually plane figures, like squares, rectangles and circles.

• 3D or three-dimensional shapes have length, breadth or width and depth or height Example: Cuboids, Cylinders, Spheres and Pyramids.

B: Value Based Activities:

B1: An event which can be correlated to the phrase "Don't judge a book by its cover" (Perspective taking & Equality). Teacher shall narrate the incident:

Once Sudha Murthy – The Infosys foundation Chairman was Called Cattle Class and Told to Queue up for Economy Flight at London Heathrow

That's how Sudha Murthy was treated at London's Heathrow International Airport. She was abhorred as someone from the 'cattle class' and asked to stand in the queue for economy class flights to India when she was waiting to board her business class flight to Bangalore. Sudha Murthy is a devoted philanthropist, a widely published author, and the chairman of Infosys Foundation.

The grey-haired Sudha Murthy dressed in a plain salwar kameez was sitting in the boarding area at London Heathrow Airport. She stood up to join the queue for the business class flight to Bangalore after the boarding announcement was made. The woman before her in the queue was dressed in an Indo-Western silk outfit. She was carrying a Gucci handbag and wearing high heels. She was accompanied by a wellgroomed lady in an expensive silk sari accessorized with diamond bangles, a pearl necklace and earrings.

The moment Sudha Murthy stepped out of the queue to get some water from a nearby water dispenser; the woman in front of her turned sideways, approached her in an uncanny manner, and asked her to show her boarding pass. Sudha Murthy was about to show the boarding pass, but she held back and asked, 'Why?' as the woman did not seem like an airline employee.

Well, this line is meant for business class travellers only,' the woman said confidently. Pointing her finger towards the economy class queue, she said, 'You should go and stand there.'

It made her wonder why the woman thought that she was not worthy of traveling in the business class. She held back from telling her upfront that she had a business class ticket; rather, she asked why she should stand there.

With a sigh, the woman said, 'Let me explain. A business class seat is two and a half times pricier than an economy flight ticket.' Her friend interrupted (the well-groomed lady) and said, 'Actually, it costs three times more than economy' adding to her friend, the woman said that there are certain privileges for business class travelers.

In her mischievous reply, Sudha Murthy said that she would like to know what privileges are associated with a business class air ticket. It annoyed the woman and her friend a little. 'Business class tickets come with baggage allowance for two check-in bags. There is a less crowded queue with early boarding privilege for business travelers. Better meals are served in the business class. Seats can be extended to a flat bed. A business cabin has four washrooms for a small number of passengers,' said the woman. 'A priority baggage check-in facility is available for business class passengers. A business class flight earns you more frequent flyer miles than an economy one,' added her friend.

After narrating the difference between business class and economy class, the woman told her to go to the economy queue. 'But I don't want to go there,' said Sudha Murthy firmly. The woman turned to her friend and whispered, 'It is difficult to argue with the cattle class. Let the staff come and deal with her. She won't listen to us.'

Instead of furthering the conversation with the women, Sudha Murthy moved forward in the queue. The women were eagerly waiting to see what would happen when she handed over her boarding pass to the attendant. The woman smiled, greeted her and moved on to the next traveler.

Sudha Murthy walked a few steps ahead from the boarding counter. But she thought of giving the women a piece of her mind and came back. She politely asked what made them think that she could not afford business class travel. She continued, 'You refer to the term "cattle class". Class does not mean possession of a huge amount of money. One may have lots of money to afford comfort and luxuries, but it does not buy you class. Mother Teresa was a classy woman, and so is Manjula Bhargava(a great mathematician) . The thought that one gains class by acquiring money is obsolete. 'Then she left the place and went on to board the plane.

Ironically, Sudha Murthy ran into the same lady later in the day where sudha Murthy was pitching Infosys Foundation to sponsor funds for the overhaul of a government school. Needless to say the woman was shocked to see Sudha Murthy chairing the meeting.

Discussion:

After narrating this story, the teacher can open the discussion to all students by asking them:-

- 1. What have you learnt from this story?
- 2. Was the woman correct in her actions?
- 3. Do you agree that humility is an important trait? Why?
- 4. Is it okay to look down upon or frown upon those that are less fortunate than us?

Through the above discussions the teacher should inculcate in students the value of being humble and to not be in a hurry to judge people based on people's appearances. One should strive to be open minded. This will help in paving the way to becoming a successful leader.

https://www.indianeagle.com/travelbeats/sudha-murthy-heathrow-airport/

This exclusive story brought to you by Travel Beats, an overseas Indian community portal and a subsidiary of IndianEagle.com, is an anecdote from her book titled 'Three Thousand Stitches: Ordinary People, Extraordinary Lives

V. C: Assignments

C1: Study on Mother Teresa and Mahatma Gandhi how simplicity and high thinking, equality decide the class not the possession of a huge amount of money, money does not buy you class.

Resources

1. https://www.indianeagle.com/travelbeats/sudha-murthy-heathrow-airport/References:

2. Ncert Textbook, Reference books,(R.D Sharma , R.S.Aggarwal)

Maths Grade VII

Teacher's Manual

Integration of Values

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