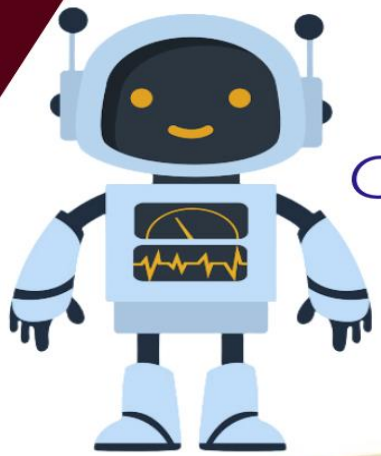
तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

KENDRIYA VIDYALAYA SANGATHAN
CHENNAI REGION



Activity Handbook

CLASS X (2024-25)

KENDRIYA VIDYALAYA SANGATHAN, CHENNAI REGION

ACTIVITY HANDBOOK- CLASS X

FOREWORD

Taking into consideration the aspirations and expectations reflected in the New Education Policy, and as per the instructions and directions of the Kendriya Vidyalaya Sangathan, Chennai Region to make the teaching and learning on activity based and experimentation oriented, this document is prepared. This document is primarily aimed at sensitizing the teachers to the concept of sports and art integrated teaching and making learning joyful. It also includes hands on activities. In addition to the activities mentioned in this document, one can adopt innovative and interesting activities too. This activity handbook will meet the expectations of students and also be a guiding map for teachers too.

SUBJECT: ENGLISH COMMUNICATIVE

INDEX

ACTIVITIES /STRATEGIES /ASSESSMENT PLANNED
CLASS-X-ENGLISH COMMUNICATIVE

LESSON (LITERATURE READER)	21ST CENTURY SKILLS	ACTIVITIES AND CLASS ROOM ORGANIZATION	ASSESSMENT CRITERIA / RUBRICS	LEARNINGOUTCOMES
FICTION 1 TWO GENTLEMEN OOF VERONA	Critical thinking Experiential learning Communication Collaboration	**WEB CHART** Traits of a gentleman" Brain storming and completion of web chart - Individual Work 		At the end of this activity, the students will be able to 1. Listen to the opinions/ideas of peers 2. Express their opinions after critical analysis. 3. Complete the web chart
	Communication Social skill	**JAM** "Appearances can be deceptive" JAM – Just a Minute speech – Individual Work	Relevance to the topic Fluency / Presentation Pronunciation	At the end of this activity, the students will be able to 1. Express their opinions with clarity 2. Uses words according to the context and delineate in speech.

	Multi-disciplinary approach - Current events	**PPT** Prepare a PPT on the recent war and its aftermath between a. Russia and Ukraine OR b. Israel and Palestine. Small group work	Content Creativity Presentation1	At the end of this activity, the students will be able to 1. Research on the given topic. 2. Anlayse the given situations 3. Present a PPT on key contemporary issues 4. Adopt an inter-disciplinary approach
FICTION 2 Mrs. PACKLETIDE'S TIGER	Creativity	**DIALOGUE WRITING**: Write a dialogue between Mrs. Packletide and the Village Headman. (Pair work)	Fluency Expression Relevance to the topic	At the end of this activity, the students will be able to 1. Organise their ideas 2. Think and express their ideas creatively.
FICTION 3 THE LETTER	Learning skill Experiential learning	**REPORT WRITING** Learners are encouraged to visit an Old Age Home. After collecting information about their daily life, write a report in 120 words.- Individual work	Format Analysis Presentation	At the end of this activity, the students will be able to 1. Convert their experiences and enhance their writing skill. 2. Use the format for report writing. 3. Organise their ideas as required for writing a report.

	Importance of family and relationships.	**INTERVIEW** Have an interview with grandparents on their opinion on how they wish to be treated by their children, and present it as a video clip- Individual work..		At the end of this activity, the students will be able to 1. Discuss the importance of family and relationships. 2. Use the technology effectively. 3. Learn the value of respecting elders.
FICTION 4 A SHADY PLOT	Creativity Experiential learning	**SPEECH** Do you believe in the existence of ghosts? Support your statement based on your experiences.		At the end of this activity, the students will be able to 1. Write / talk fluently about the given topic based on their own experiences.
	Creativity Communication	**DIALOGUE WRITING**: Imagine you meet Gandhiji's ghost. Write a dialogue on the importance of ahimsa in the current Indian political scenario.	Content Fluency Presentation	At the end of this activity, the students will be able to 1. Organise their ideas 2. Think and express their ideas creatively.
FICTION 5 PATOL BABU-A FILM STAR	Collaboration Technology literacy / Media literacy / Information literacy	**SEMINAR** Collect information on Satyajit Ray, his life and achievement in the film industry and present a seminar. (Small group work)		At the end of this activity, the students will be able to 1. Use media and internet effectively. 2. Conduct a research on the given topic. 3. Collect and collate information. 4. Prepare and present material through a seminar.

	Technology literacy / Information literacy Critical thinking	**FILM REVIEW:** Watch the movie 'Taare Zameen Par' and write a film review - Individual Work.	Format Content Presentation	At the end of this activity, the students will be able to 1. Use media and internet effectively to collect information. 2. Express his opinion critical after the required analysis.
FICTION 6 – VIRTUALLY TRUE	Creativity Critical thinking	**ARTICLE** To write an article on "Online games are harmful." – Individual work		At the end of this activity, the students will be able to 1. Analyse the pros and cons of online gaming. 2. Express their opinion in the form of an article.
	Initiative Technology literacy	**PPT** Prepare a PPT on 'Role of Artificial Intelligence in modern world."- Small group work	Content Relevance Awareness Presentation	At the end of this activity, the students will be able to 1. Use media and internet effectively. 2. Prepare and present a PPT relevant to the given topic.
POEM 1 THE FROG & THE NIGHTINGALE	Communication Collaboration Social skills	**DEBATE** "The Frog was not responsible for the death of the nightingale" – Debate on the topic – small group work	Content Relevance Presentation	At the end of this activity, the students will be able to 1. Collect and collate information. 2. Listen and appreciate peers' views. 3. Express their opinions with clarity. 4. Use the language suited for a debate.

	Art integration	**COMIC STRIP** Comic strip of the poem (Small group activity)	Creativity Presentation	At the end of this activity, the students will be able to 1. Convert a poem into a dialogue. 2. Present the dialogue as a comic strip. 3. Present the comic strip in an appealing manner.
	Art Integration Creativity	**POSTER** Prepare a poster, as put up by the frog, informing the residents of the Bingle Bog about the musical night of the nightingale. (Individual activity)		At the end of this activity, the students will be able to 1. Prepare a poster with the relevant details. 2. Present the poster in an appealing manner. .
	Communication Social skills	**CLASS DISCUSSION** 'Beauty parlours and using cosmetics will certainly improve one's self-image and self-confidence.'- Class discussion Whole class activity	Content Fluency Accuracy	At the end of this activity, the students will be able to 1. Discuss on the given topic. 2. Listen to their peer's opinions. 3. Express their opinions on the subject with clarity. 4. Use supportive arguments effectively

	Creativity Analytical skills	**DIARY ENTRY** The nightingale is depressed and writes a diary entry on the day when she is criticized cruelly by the frog. – Individual work		At the end of this activity, the students will be able to 1. Express their feelings and emotions with coherency. 2. Use the relevant format for writing a diary.
POEM 2. NOT MARBLE NOR THE GILDED MONUMENTS	Collaboration Information literacy	**PPT** Prepare a PPT on any four types of poetry with examples and conduct a seminar. (sonnet, ballad, lyric, free verse, ode, limerick, elegy) Small group work –6 students in a group- two for preparing PPT, one each to present one type of poetry.		At the end of this activity, the students will be able to 1. Research on the given topic. 2. Select suitable examples. 3. Present a PPT effectively.
	Multi-disciplinary approach - History	**PPT** 'Art is indestructible.' Prepare a PPTand justify this statement with an example of any artiste whose work has stood the test of time and still remains famous.- Small group work	Content Relevance Presentation of ideas Techniques/ methods	At the end of this activity, the students will be able to 1. Research on the given topic. 2. Adopt an inter-disciplinary approach 3. Present the PPT relevant to the topic.

POEM 3 - OZYMANDIAS	Creativity Collaboration	**INTERVIEW** Write an interview with Ozymandias when he comes to life and visits the place where his statue was . (Pair work)	Content Research Presentation Relevance to the topic	At the end of this activity, the students will be able to 1. Prepare a set of questions relevant to the interview. 2. Ask the questions in the proper question format. 3. Communicate and collaborate and write the interview in its proper format.
	Multi-disciplinary activity	**SEMINAR** Choose any famous ancient ruin(Keezhadi / Colosseum or any other ruin) and prepare a seminar with charts/PPT. (Small group work)	Rhyme and rhythm Pronunciation Overall presentation	At the end of this activity, the students will be able to 1. Research on the given topic. 2. Adopt an inter-disciplinary approach 3. Present the PPT relevant to the topic..
	Subject enrichment activity Learning skills Initiative	**RECITATION** Recitation of either 'Ozymandias' OR ' Not marbles nor the gilded monuments' - Individual work		At the end of this activity, the students will be able to 1. Recite the poem with proper pause, intonation and modulation..

POEM 5 THE RIME OF THE ANCIENT MARINER	Learning skills	**CHART PREPARATION** Prepare a chart on the poetic devices used in the poem with relevant examples.		At the end of this activity, the students will be able to 1. Identify the various poetic devices. 2. Prepare a chart on the given topic.
	Collaboration Technology literacy Media literacy Information literacy	**SEMINAR** Trace the voyage of Christopher Columbus, Magellan or Vasco de Gama through a video or a PPT and present a seminar. (Small groupwork)	Content Research Presentation Relevance to the topic	At the end of this activity, the students will be able to 1. Research on the given topic. 2. Collect and collate information. 3. Use technology justly to create a video \ PPT. 4. Present it effectively.
POEM 4 SNAKE	Creativity Social skills Life skills	**SPEECH** "Man is a bundle ofcontradictions"- Speech – Individual work		At the end of this activity, the students will be able to 1. Express their opinions with clarity 2. Use words according to the context and delineate in speech.

	Creativity	**CALLIGRAM** Write a calligram (Flower / Tree) Refer textbook. Pg.No: 133 (Individual work)	Creativity Aptness Presentation	At the end of this activity, the students will be able to 1. Enhance their creativity. 2. Write a calligram.
DRAMA 1 THE DEAR DEPARTED	Survey Collaboration Communication Initiative Analytical skills	**REPORT** Have a talk with grand parents and write a report on their views on the present day generation's 1. Excessive use of mobiles 2. Food habits 3. Dress 4. Movies 5. Music 6. Attitude towards life and people 7. Marks 8. Family time Individual work		At the end of this activity, the students will be able to 1. Communicate effectively with the elders. 2. Collect and collate necessary information. 3. Analyse and express their findings in the form of a report.
	Social skills Leadership skills Communication	**ROLE PLAY** Role play – any part of the play – small group work	Dialogue delivery Teamwork Interactive competency	At the end of this activity, the students will be able to 2. Express the qualities of the characters using suitable body language, intonation and modulation.

DRAMA 2 JULIUS CAESAR	Communciation	**DECLAMATION** Soliloquy of Antony / Public address of Antony / Brutus' speech to the Romans – Individual work	Memory Intonation Presentation	At the end of this activity, the students will be able to 1. Present the speech / soliloquy with proper pause, intonation and modulation.
	Creativity Analytical skill	**DIARY ENTRY** Diary entry by Brutus on the day when the Romans turn against him after Antony's speech. – Individual work	Content Organisation of ideas Fluency Accuracy	At the end of this activity, the students will be able to 1. Express their feelings and emotions with coherency. Use the relevant format for writing a diary.
	Technological literacy Media literacy	Prepare a list of 15 new words / phrases coined by Shakespeare in this play.		

SUBJECT: HINDI

गतिविधि पुस्तिका (2024-2025)

विषय सूची

क्रम संख्या	भाग/खंड	पाठ/कविता के नाम
1	गद्य भाग	1.नेताजी का चश्मा
2		2.बालगोबिन भगत
3		3.लखनवी अंदाज़
4		4.एक कहानी यह भी
5		5.नौबतखाने में इबादत
6		6.संस्कृति
7	पद्य भाग	7.सूरदास के पद
8		8.राम-लक्ष्मण-परशुराम संवाद
9		9.आत्मकथ्य
10		10.यह दन्तुरित मुस्कान एवं फसल
11		11.उत्साह एवं अट नहीं रही है
12		12.संगतकार
13	पूरक गद्य	13.माता का अंचल
14		14.साना साना हाथ जोडि.....
15		15.मैं क्यों लिखता हूँ

क्रम संख्या	पाठ का नाम	शीर्षक	सीखने के उद्देश्य	गतिविधियां	सीखने के परिणाम
1 गद्य भाग	**नेता जी का चश्मा स्वयं प्रकाश**	**सूचना एकत्र करना** **वाद विवाद**	सुभाष चन्द्र बोस के जीवन से प्रेरणा लेना देश भक्ति की भावना उत्पन्न करना खोजपरक दृष्टिकोण उत्पन्न करना लेखन एवम पठन कौशल तथा वाचन की क्षमता को विकसित करना विचार विश्लेषण की दक्षता विकसित करना तार्किकता एवं चिंतन क्षमता का विकास करना छात्रों के श्रवन-वाचन कौशलों का विकास करना सामान्य ज्ञान में वृद्धि करना	शिक्षक मूल्यांकन आधार श्यामपट पर पहले ही लिख देगा यह कार्य दो या तीन दिन पूर्व दिया जाए यह कार्य व्यक्तिगत रूप से दिया जाए निर्धारित समय पर सभी छात्र एकत्रित सूचनाएं कक्षा में 1-1 मिनट में सुनाएँगे सामूहिक कार्य कराया जाए सर्वप्रथम शिक्षक विषय की पूरी जानकारी देंगे कक्षा को चार समूहो में विभक्त किया जाएगा दो समूह पक्ष में विषय तैयार करेंगे तथा दो समूह विपक्ष में	सुभाष चन्द्र बोस के जीवन से प्रेरणा लेना देश भक्ति की भावना जागृत होना भारत के इतिहास के बारे में जानकारी पठन कौशल का विकास सामूहिकता के कारण आपसी सहमति बनना। छात्रों को प्रोत्साहन मिलेगा। बोलने में संकोची छात्रों को प्रेरित करेंगे ।
2	**बाल गोविन भगत रामवृक्ष बेनीपुरी**	**भेंटवार्ता** **लोकगीतों का संकलन**	भेंटवार्ता विधि से परिचित कराना कबीर के विषय में और अधिक जानकारी देना कल्पनाशीलता का विकास करना वाचन,पठन,लेखन व श्रवण कौशल का विकास करना गायन कौशल का विकास करना लोकगीतों का महत्व समझाना भारतीय संस्कृति से परिचित कराना खोजी प्रवृत्ति को बढावा देना	**यह व्यक्तिगत कार्य होगा** **इसके लिए एक या दो दिन का समय दिया जाएगा।** **यह प्रक्रिया एक कालांश में सम्पन्न हो जाएगी** **यह समूहिक कार्य हैं** **यह कार्य ,प्रक्रिया से एक सप्ताह पूर्व दिया जाएगा ताकि छात्र लोकगीतों का संकलन कर सके** **मूल्यांकन के आधार शिक्षक श्यामपट पर लिख देंगे**	रोचक एवं प्रभावशाली लेखन कर पाएंगे। [illegible] शिक्षक स्वयं उदाहरण देकर उनका मार्ग दर्शन करें गायन शैली का का विकास होगा। लोकगीतों के महत्व को समझ पाएंगे। सामान्य प्रस्तुति देने वालों को सहायता दी जाएगी ।

3	लखनवी अंदाज यशपाल	शब्दो का संग्रह समूह चर्चा	उर्दू शब्दों का ज्ञान और उनसे अवगत कराना शब्द भंडार में वृद्धि करना भाषा की प्रकृति की जानकारी देना भाषा के मूल स्वरूप को समझाना ग्रीष्म ऋतु के खानपान से सचेत करना मौसमी फसलों की जानकारी देना फल,सब्जी एवं फसलों का महत्व समझाना सामान्य ज्ञान की वृद्धि करना	व्यक्तिगत कार्य शिक्षक द्वारा कुछ उर्दू के शब्द श्यामपट पर लिखे जाएंगे उन शब्दों के समक्ष वे उनका हिन्दी रूपान्तरण लिखे और उनका अर्थ भी लिखे। अर्थ भी लिखे समूहिक कार्य कराया जाएगा सर्वप्रथम शिक्षक विषय पर चर्चा करेगा कक्षा को चार समूहो में विभक्त किया जाएगा इस कार्य के लिए 10 मिनट का समय दिया जाएगा ।	सही शब्द लिखनेवाले छात्र प्रेरित होंगे। अच्छे अंक लाने के लिए प्रोत्साहन मिलेगा। छात्र अन्य भाषाओं के शब्दो की जानकारी प्राप्त करेंगे। मौसमी फलों के विषय में जानेंगे। चर्चा का विकास होना समूह में कार्य करने की प्रेरणा मिलेगी।
4	एक कहानी यह भी -मन्नू भंडारी	वाद-विवाद लेखन, उपन्यास सूची और एलबम बनाना	1..समाज में नारी की विभिन्न भूमिकाओं को लेकर समझ विकसित करना 2. आंचलिक शब्दो की जानकारी होना 3. शब्दो के प्रयोग का ज्ञान होना 4. भाव की समझ में वृद्धि होना	गतिविधि 1 - वाद - विवाद) आज भी लड़कियों को घर की चार दीवारी तक सीमित रखा जाता है (गतिविधि 2 - महानगरों में रहने वाले लोग 'पड़ोस कल्चर' से वंचित हैं इसके बारे में अपने विचार लिखना । गतिविधि 3 - मन्नू भंडारी द्वारा पढ़े गए उपन्यासों की सूची बनाना एवं	• अपने अनुभवों को अपनी भाषा-शैली में लिख पाएंगे। लेखन के विविध तरीके और शैलियों का प्रयोग कर पाएंगे। • भाषा की बारीकियों तथा नए शब्दों का प्रयोग कर पाएंगे। पढ़कर अपरिचित परिस्थितियों और घटनाओं की कल्पना कर सकेंगें और उन पर अपने मन में

				उनकी किसी एक उपन्यास की समीक्षा लिखना गतिविधि 4 - अपने बचपन के अनुभवों का एक एल्बम तैयार करके अपने मित्रों के साथ साझा करना) बचपन में सीखे सकारात्मक आदतों का भी उल्लेख करन	बनने वाली छवियों और विचारों के बारे में मौखिक/सांकेतिक भाषा में बताने में सक्षम होंगे।
5	नौबतखाने में इबादत -यतीन्द्र मिश्र	वाद्ययंत्रों पर चर्चा, प्रश्नोत्तरी, विभिन्न पुरस्कारों का विवरण	1. कला के महत्व को जानना 2. संगीत की साधना को जानना 3. लगातार प्रयास करने की सीख	गतिविधि 1 - शहनाई जैसे वाद्य यंत्रों के चित्र कक्षा में लाकर उनके बारे में चर्चा करना) वे किस वस्तु से बने हैं, कहाँ-कहाँ यह वाद्य यंत्र मशहूर हैं, आदि(गतिविधि - 2 - प्रसिद्ध वाद्य-यंत्र वादक के नाम एवं वे किस वाद्य-यंत्र से जुड़े हैं इसकी प्रश्नोत्तरी का आयोजन करना गतिविधि 3 - किसी भी वाद्य यंत्र के साथ कक्षा में देशभक्ति गीत गायन) समूह गीत(गतिविधि 4 - भारतरत्न, पद्मश्री, पद्म विभूषण, पद्मभूषण परमवीर चक्र जैसे उपाधियों की जानकारी हासिल करना और उसका एक रिपोर्ट तैयार करना) सामूहिक	• विभिन्न पठन सामग्रियों को पढ़ते हुए उनके शिल्प की सराहना करते हैं और अपने स्तरानुकूल मौखिक, लिखित सांकेतिक रूप में उसके बारे में अपने विचार व्यक्त करते हैं। • अपने अनुभवों को अपनी भाषा शैली में लिखते हैं.लेखन के विविध तरीके और शैलियों का प्रयोग करते हैं • भाषा की बारीकियों तथा नए शब्दों का प्रयोग करते हैं। पढ़कर अपरिचित परिस्थितियों और घटनाओं की कल्पना करते हैं और उन पर अपने मन में बनने वाली छवियों और विचारों

				गतिविधि(	के बारे में मौखिक/सांकेतिक भाषा में बताते हैं।
6	संस्कृति - भदन्त आनंद कौसल्यायन	आविष्कारों की सूची बनाना, वाद-विवाद	1. निबंध के माध्यम से हमारी सभ्यता संस्कृति से जुड़े जटिल विषयों को समझना 2. सभ्यता और संस्कृति के अंतर जानने में सक्षम होना 3. मानव के सकारात्मक गुणों जानना	गतिविधि 1 - प्रसिद्ध आविष्कर्ताओं के नाम .किसी भी विषय में और उनके द्वारा आविष्कार की वस्तुओं की सूची चित्र सहित बनाकर पी पी टी के माध्यम से प्रस्तुत करना 2. संस्कृत व्यक्ति के अनेक उदहारण जो समाज में रोज़ घटित होते हुए देखते हैं इस विषय पर चर्चा करना 3.. जो भी आविष्कार हुए हैं क्या उनसे सभी मानव समूह को लाभ पहुँचता है ? (वाद-विवाद का आयोजन(	"• अपने अनुभवों को अपनी भाषा शैली में लिखते हैं। •लेखन के विविध तरीके और शैलियों का प्रयोग करते हैं जैसे अनुच्छेद लेखन, कहानी,कविता या निबंध के माध्यम से कोई अनुभव लिखना। • पढ़कर अपरिचित परिस्थितियों और घटनाओं की कल्पना करते हैं और उन पर अपने मन में बनने वाली छवियों और विचारों के बारे में लिखित या मौखिक भाषा में अभिव्यक्ति करते हैं।"
पद्य भाग 7	सूरदास के पद, कवि सूरदास	ऊधौ, तुम हौ अति बड़भागी ।.....	1.पद में प्रयुक्त लय को समझना । 2.कविता के महत्व को जानना । 3.शब्दभेद के प्रकार को समझना । 4. कविता की मौखिक लिखित	1कृष्ण के जीवन का नाट्य रूपांतरण । 2. कविता में प्रयुक्त ब्रजका भावग्रहण भाषा के शब्दों का अर्थ वर्तमान प्रयुक्त हिन्दी मे चार्ट के द्वारा प्रस्तुत करना	1. प्रस्तुत कविता की तरह अन्य कविताओ का संकलन करेंगे और बोलेंगे। 2.कविता को आत्मसात करेंगे । 3.ब्रज भाषा और वर्तमान

			अभिव्यक्ति करना । 5. सूरदास श्रीकृष्ण के परम भक्त थे 6.उन्होंने जीवनपर्यंत भगवान श्रीकृष्ण की भक्ति की और ब्रज भाषा में उनकी लीलाओं का वर्णन किया .।	3.प्रस्तुत कविता का नाट्य रूपांतरण	मे प्रयुक्त हिंदी के शब्दों को जानेंगे। 4. कविता की मौखिक/लिखित अभिव्यक्ति करने मे समर्थ होंगे । 5.भक्ति की महत्ता को समझकर ईश्वर की भक्ति को जान पाएंगे।
8	राम लक्ष्मण परशुराम संवाद, कवि तुलसीदास	नाथ संभुधनु भंजनिहारा, होइहि केउ एक दास तुम्हारा	1.पद में प्रयुक्त लय को समझाना 2.कविता के महत्व को जानना। 3.शब्दभेद के प्रकार को समझाना। 4. कविता की मौखिक/लिखित अभिव्यक्ति करना । 5. रामायण में वर्णित इस संवाद के माध्यम से छात्रों को धार्मिक और सामाजिक मूल्यों को समझने का अवसर प्रदान करना 6.अवधी भाषा का ज्ञान प्राप्त करना।	1.राम के जीवन का नाट्य रूपांतरण । 2. कविता में प्रयुक्त अवधी भाषा के शब्दों का अर्थ वर्तमान प्रयुक्त हिन्दी मे चार्ट के द्वारा प्रस्तुत करना 3.प्रस्तुत कविता का नाट्य रूपांतरण	1. प्रस्तुत कविता की तरह अन्य कविताओ का संकलन करेंगे और बोलेंगे । 2. कविता को आत्मसात करेंगे । 3.अवधी भाषा और वर्तमान मे प्रयुक्त हिंदी के शब्दों को जानेंगे। 4. कविता की मौखिक/लिखित अभिव्यक्ति करने में समर्थ होंगे। 5.इस पाठ में निहित संदेश यह है कि हमें क्रोध करने से बचना चाहिए। यह हमारी बुद्धि / विवेक का नाश कर देता है।

					क्रोधी व्यक्ति ऐसे कार्य करता है जिससे वह उपहास का पात्र बन जाता है। हमें सदैव विनम्र, शांत एवं कोमल व्यवहार करना चाहिए।
9	आत्मकथ्य, कवि जयशंकर प्रसाद	मधुप गुन-गुना कर कह जाता कौन कहानी यह अपनी,.....	1.कविता का उद्देश्य सौन्दर्यभाव को जागृत करना है। जिस सौन्दर्य को हम अपने आस - पास विद्यमान होते हुए भी अनुभव नहीं कर पाते उसे कविता के माध्यम से अनुभव करने लगते हैं। क्योंकि कविता श्रोता को एक सौन्दर्य बोधक दृष्टि प्रदान करती है और वे भाव - सौन्दर्य, शब्द-सौन्दर्य तथा ध्वनि-सौन्दर्य सभी की अनुभूति करने लगते हैं । 2.कविता के महत्व को जानना । 3.शब्दभेद के प्रकार को समझना । 4. कविता की मौखिक लिखित अभिव्यक्ति अभिव्यक्ति करना । 5.कविता हमें अपने मन के अनुकूल जीवन जीने की प्रेरणा देती है।	1.अपने जीवन के किसी घटना का वर्णन करना 2. कविता में प्रयुक्त खड़ी बोली हिंदी भाषा शब्दों का अर्थ वर्तमान में प्रयुक्त हिन्दी मे चार्ट के द्वारा प्रस्तुत करना 3.प्रस्तुत कविता का नाट्य रूपांतरण 4. विचार अभिव्यक्ति विकसित होगी।.	1. प्रस्तुत कविता की तरह अन्य कविताओ का संकलन करेंगे और बोलेंगे । 2.कविता को आत्मसात करेंगे । 3.खडी बोली भाषा और वर्तमान मे प्रयुक्त हिंदी के शब्दों को जानेंगे। 4. कविता की मौखिक लिखित अभिव्यक्ति करने मे समर्थ होंगे । 5. हमें अपने मन के ५.कविता अनुकूल जीवन जीने की प्रेरणा देती है। हमें सांसारिक जीवन की समस्याओं से जूझते हुए भी सभी से स्नेह करना चाहिए। जीवन के सुख-दुःख को समभाव से

					स्वीकार करना
10	यह दंतुरित मुस्कान, कवि नागार्जुन	हंसी का महत्व	हंसी के महत्व का बोध कराना।	1. जूनियर हंसी क्लब का आयोजन :छात्रों को हंसी के महत्व को समझाने के लिए जूनियर हंसी क्लब का आयोजन किया जा सकता है, जिसमें वे कॉमेडी स्किट्स या हंसी और मनोरंजन से संबंधित गतिविधियों में भाग ले सकते हैं। 2. हंसी के फायदे और प्रकार पर वार्तालाप :छात्रों को समूह में मिलकर हंसी के विभिन्न प्रकारों और इसके लाभों पर विचार करने के लिए वार्तालाप कराया जा सकता है। 3. हंसी के महत्व का नाट्याभिनय : एक नाट्याभिनय कार्यक्रम का आयोजन करके छात्रों को हंसी के महत्व को समझाने और समाज को हंसाने के महत्व को प्रस्तुत करने का अवसर मिल सकता है।	छात्रों को सहयोग, संगठन, और समस्या समाधान के कौशल में सुधार करने का अवसर मिलता है। वे ग्रुप डायनामिक्स, टीमवर्क, और कार्य संकलन प्रक्रिया के महत्व को समझते हैं, जो उन्हें अधिक उत्कृष्ट सहयोग, संगठनात्मक कौशल, और समस्या समाधान की प्राप्ति के लिए तैयार करता है।
		वातावरण	1. बच्चों को एक सकारात्मक और खुशहाल जीवन जीने के महत्व को समझाना। 2. बच्चों को उत्साहित करना कि वे अपनी मुस्कान को अपने साथी और	गतिविधि: मुस्कान के प्रेरक किस्से 1.समूह में वार्ता :छात्रों को समूह में बातचीत करने के लिए आमंत्रित किया जाता है। हर छात्र को एक	1. बच्चे एक सकारात्मक माहौल में अपने आस-पास के लोगों के साथ खुशहाली बाँटने का महत्व समझते हैं।

	यह दंतुरित मुस्कान, कवि नागार्जुन	को खुशहाल बनाना	आस-पास के लोगों के साथ साझा करें। 3. बच्चों को एक सकारात्मक और खुशहाल जीवन जीने के लिए प्रेरित करना।	किस्सा सुनाने का मौका दिया जाता है जिसमें उन्हें अपनी मुस्कान के पीछे का कारण या उन्हें खुश और प्रेरित करने वाली कोई घटना या अनुभव बताना है । 2. मुस्कान की छवि :छात्रों क कागज पर एक खुशहाल और प्रेरित करने वाली स्थिति का वर्णन करने के लिए कहा जाता है। यह स्थिति किसी भी अनुभव की गयी घटना, सपना, या समय की हो सकती है जिसने उन्हें खुश और प्रसन्न किया हो। 3. मुस्कान की बातचीत :छात्रों को एक-दूसरे के साथ बैठकर उन चीजों के बारे में चर्चा करने के लिए कहा जाता है जो उन्हें मुस्कान और खुशी में लाते हैं। इसमें वे अपने दिनचर्या, व्यक्तित्व, और अन्य अनुभवों के बारे में बातचीत कर सकते हैं जो उन्हें खुश और प्रेरित करते हैं।	2. उन्हें अपनी मुस्कान की शक्ति को देखने के लिए प्रेरित किया जाता है, जो उनके और उनके आस-पास के लोगों के दिन को उजागर कर सकती है। 3. बच्चों को सामाजिक और आत्मिक उत्तरदायित्व का अहसास होता है, जिससे वे अपनी मुस्कान को सभी के साथ साझा करने के लिए उत्सुक होते हैं।
		खेती के विभिन्न कारकों /प्रमुख अंगों का	छात्रों को खेती में प्रमुख अंगों जैसे कि मिट्टी, पानी, और सूर्य के महत्व को समझना।	छात्रों को फसलों की उत्पादन प्रक्रिया में उपयुक्त तकनीकों के बारे में जानकारी प्राप्त करने के लिए विभिन्न तकनीकों का अध्ययन कराना।	छात्रों को खेती के विभिन्न कारकों/ प्रमुख अंगों के महत्व का ज्ञान होगा।

	फसल	ज्ञान			
		फसलों की उत्पादन प्रक्रिया	फसलों की उत्पादन प्रक्रिया का बोध कराना।	छात्रों को खेती से संबंधित उदाहरणों का अध्ययन कराकर खेती की व्यापकता और महत्व को समझाने के लिए गतिविधियों का आयोजन किया जा सकता है।	छात्रों को उपयुक्त तकनीकों और उपायों के माध्यम से फसलों की उत्पादन प्रक्रिया में अधिक समझ और निपुणता प्राप्त होगी।
11	उत्साह, कवि सूर्यकांत त्रिपाठी निराला	ऋतुओं का महत्व समझाना	छात्रों को ऋतुओं के महत्व को समझाना और इसे गहराई से अनुभव करने का अवसर प्रदान करना।	इसके महत्व को एक नाटक के रूप में प्रस्तुत कर सकते हैं, जहां उन्हें अलग-अलग ऋतुओं की भूमिकाओं का अभिनय करना होगा।	यह नाटक छात्रों को ऋतुओं की विविधता और प्रत्येक के अनुभव को समझने का माध्यम प्रदान करेगा। इससे उन्हें विभिन्न ऋतुओं के महत्व की समझ में मदद मिलेगी, जैसे की फसलों की प्रमुखता, जल संसाधन का महत्त्व और हमारे जीवन पर ऋतुओं का प्रभाव।
		सृजनात्मकता की प्रवृत्ति	1. छात्रों को सृजनात्मकता की प्रवृत्ति को विकसित करने के लिए प्रेरित करना।	छात्रों को एक कला प्रदर्शनी का आयोजन करने के लिए अनुमति दें।	1. छात्र सृजनात्मक विचार को प्रोत्साहित करते हैं

		का विकास करना	2. विभिन्न कला रूपों के माध्यम से विचार और अभिव्यक्ति का मार्गदर्शन प्रदान करना।	1. छात्रों को प्रतियोगिताओं में भाग लेने के लिए प्रोत्साहित करें, जैसे कि चित्रकला, संगीत, नृत्य, कविता गायन, नाटक, आदि। 2. प्रदर्शनी- स्कूल और कॉलेज में प्रदर्शिनी का आयोजित किया जा सकता है। 3. छात्रों को उनकी कला दक्षता को प्रदर्शित करने का अवसर दें और उन्हे प्रतिक्रिया प्रदान करें।	और अपनी श्रेष्ठता क्षेत्र में उत्कृष्टता की ओर प्रेरित होते हैं। 2. छात्र अपने कौशल को साझा करने के लिए साहसिक होते हैं और अपनी सृजनात्मकता को समाज में प्रदर्शित करते हैं।
	अट नहीं रही है	फागुन मास की शोभा का वर्णन	छात्रों को फागुन मास की शोभा को समझाना।	छात्रों को स्थल के अवलोकन के लिए बाहर ले जाकर प्राकृतिक सौंदर्य को देखने का अवसर देना।	छात्रों को फागुन मास की मस्ती और शोभा के महत्व को समझाया जाएगा। c.
		भावप्रवाह	छात्रों को कवि के भावप्रवाह को समझाना।	छात्रों से कविता के विषय पर सृजनात्मक लेखन करने की प्रेरणा देना।	छात्रों भावप्रवाह को समझ पाएंगे और लेखन कौशल में सुधार होगा।
12	संगतकार, कवि -मंगलेश डबराल	कार्य में रोचकता उत्पन्न करना	छात्रों को वातावरण में रोचकता और संगीत के महत्व को समझाना।	1. रंगीन कार्यक्रम :स्कूल में रंगीन कार्यक्रम का आयोजन करें जिसमें छात्रों को विभिन्न प्रतियोगिताओं और सांस्कृतिक गतिविधियों में भाग लेने का मौका मिले। 2. संगीत और नृत्य :संगीत और नृत्य के साथ कक्षा में रोचकता का माहौल बनाएं। छात्रों को संगीत	छात्र वातावरण में रोचकता को महसूस करते हैं और साथ ही कार्यों में सहभागिता से संगीतिक और सांस्कृतिक दृष्टिकोण को समझते हैं।

				और नृत्य के माध्यम से सांस्कृतिक अनुभव का अवसर प्रदान करें। 3.कहानी सुनाना :छात्रों को रोचक कहानियों का संवाद और प्रस्तुतीकरण करके एक-दूसरे को मनोरंजन करने का मौका दें।	

कृतिका भाग-2		आंचलिक शब्द	1.भाषा ज्ञान में वृद्धि होना 2.आंचलिक शब्दों का समझना 3. शब्दों के अर्थ प्रयोग एवं विविधता का ज्ञान कराना 4. भाव ग्रहण क्षमता विकसित करना 5. छात्रों की जिज्ञासा प्रवृत्ति को शांत करना।	**अध्यापक द्वारा आंचलिक शब्दों के अर्थ व प्रयोग को पाठ के आधार पर स्पष्ट किया जाएगा। कक्षा को दो समूह में विभक्त करके एक समूह आंचलिक शब्द बोलेगा तथा दूसरा समूह उसका अर्थ बताएगा। यह प्रक्रिया परिवर्तित भी होगी	1.शब्द भंडार विकसित होना 2.शब्दों का सही उच्चारण कर पाना 3.अर्थ का स्पष्टीकरण कर पाना 4.सक्रिय सहभागिता प्राप्त करना।
13	माता का आंचल लेखक शिवपूजन सहाय	खेल प्रदर्शन विधि	1.बचपन के खेलों का महत्व समझाना 2.खेलो द्वारा मेलजोल परिचय बढ़ाना 3. बचपन की प्रत्येक खेल विधि को समझना 4.शारीरिक सक्रियता और स्वास्थ्य के लिए भाव ग्रहण 5. मिलजुल कर कार्य करने की प्रेरणा प्राप्त करना।	**कक्षा के वातावरण को सजीव एवं प्रसन्नतादायक बनाने के लिए कुछ विद्यार्थियों द्वारा बचपन में बाल मंडली के खेलों का प्रदर्शन करना। कक्षा में समूह बनाकर प्रत्येक समूह से एक बचपन के खेल खिलाना ।	1.विद्यार्थियों में मेलजोल की भावना बढ़ेगी 2.कार्य के प्रति सक्रियता उत्पन्न होगी 3.परस्पर समरसता की भावना उत्पन्न होगी।

14	साना-साना हाथ जोडी..... लेखिका मधु काकरिया	विभिन्न राज्यों की जानकारी का कार्य पत्रक	1.सामान्य ज्ञान में वृद्धि करना 2.सृजनात्मकता का विकास करना। 3. खोज प्रवृत्ति का विकास करना। 4. विभिन्न राज्यों के प्रति जुड़ाव एवं लगाव रखना।	**"कार्य प्रपत्र" यह कार्य छाया प्रति से करवाया जाए, जिसमें प्राप्त की जाने वाली जानकारी का विवरण इस प्रकार होगी। 1. राज्य का नाम व उसकी राजधानी 2. राज्य की प्रमुख वेशभूषा ,पहनावा 3.खानपान 4.राज्य की प्रमुख भाषा या बोली 5.प्रसिद्ध लोक नृत्य 6.प्रसिद्ध पर्यटन स्थल 7.प्राकृतिक सौंदर्य व जलवायु 8. प्रमुख फसल 9.प्रसिद्ध व्यक्ति	1.विशिष्ट राज्य की जानकारी प्राप्त कर पाना 2.सामान्य ज्ञान में वृद्धि होना 3.सृजनात्मक सोच विकसित होना।
	साना-साना हाथ जोडी..... लेखिका मधु काकरिया	पर्यटक एवं पर्यटन गाइड के बीच संवाद वाचन	1.पर्यटन की ओर रुचि उत्पन्न करना 2.वाचन कौशल विकसित करना 3.सामान्य ज्ञान में वृद्धि करना 4.सहभागिता की प्रवृत्ति का विकास करना।	**विद्यार्थी अपने या किसी देखे हुए पर्यटन स्थल के बारे में परस्पर पूर्व तैयारी के आधार पर संवाद-वाचन करेंगे।	1.विषय की जानकारी प्राप्त कर पाना। 2.स्पष्ट एवं सहज उच्चारण कर पाना। 3.प्रस्तुतीकरण एवं हाव-भाव प्रकट करना।
		आलस्य मनुष्य का सबसे बड़ा शत्रु है।' विषय पर लेखन	1.आलसी व्यक्ति के दुर्गुणों को जानना 2. जीवन में कार्य के महत्व को समझना। 3. मानव जीवन एक अनमोल उपहार है –उक्ति की की सार्थकता जानना। 4.लेखन कौशल का विकास करना।	**कक्षा को चार समूह में बांटकर प्रत्येक समूह को अलग-अलग बिंदु के आधार पर लेखन कार्य करना होगा। जैसे 1.अपना हाथ जगन्नाथ 2.कर्म ही पूजा है। 3.जो सोता है, उसका भाग्य भी सोता है। 4.आलसी मनुष्य	1.कार्य को समय पर किए जाने की प्रवृत्ति विकसित होगी 2.लेखन कौशल का विकास होगा 3.विचार अभिव्यक्ति विकसित होगी।

15	मैं क्यों लिखता हूं . लेखक- सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय'			पशु समान है।	
		डायरी लेखन	1.डायरी लेखन कला से परिचित होना 2.अपने कार्य को योजनाबद्ध ढंग से लिखना सीखना 3.स्वयं के विचारों को सुनिश्चित कर पाना 4.एकाकी क्षणों में डायरी पढ़ने का आनंद प्राप्त कर पाना 5.लेखन कौशल का विकास करना।	**छात्र व्यक्तिगत रूप से डायरी लेखन में स्थान, समय, कारण इत्यादि को लिखेंगे। जीवन से जुड़ी किसी घटना का उल्लेख भी समय व तिथि के अनुसार करेंगे।	लेखन कौशल का विकास कर पाना जीवन के अनुभवों को स्थायित्व प्रदान करना अपने इच्छाओं को अच्छाइयों और बुराइयों को पहचानना. भाषा की दक्षता प्राप्त करना

SUBJECT: SANSKRIT

पुस्तकस्य नाम – मणिका भागः- 2

विषयसूची	
प्रथमः पाठ :	वाङ्मयम् तपः
द्वितीयः पाठः	नास्ति त्यागसमम् सुखम्
तृतीयः पाठ :	रमणीया हि सृष्टिः एषा
चतुर्थः पाठः	आज्ञा गुरूणाम् हि अविचारणीया
पञ्चमः पाठः	अभ्यासवशगम् मन
षष्ठः पाठः	राष्ट्रं संरक्षयमेव हि
सप्तमः पाठः	साधुवृत्तिम् समाचरेत्
अष्टमः पाठः	तिरुक्कुरल् –सूक्ति–सौरभम्
नवमः पाठः	सुस्वागतम् भोः अरुणाचलेऽ स्मिन्
दशमः पाठः	कालोऽ हम्
एकादशः पाठः	किम् किम् उपादेयम्

क्रम संख्या	1
पाठः	वाङ्मयं तपः
उपविषयः	भगवत् गीता सम्बद्ध श्लोकाः|
शिक्षणोद्देश्यम्	i.एतेषां श्लोकानाम् अध्ययनात् छात्राः स्व जीवने नैतिकमूल्यान् अवगच्छन्ति। ii.श्लोकशिक्षणेन उच्च्चराण सौष्ठवम् पुरातन तत्व अवबोधनम् , व्याकरण ज्ञानम् , सन्धि परिचयः प्रासुं अवकाशःकल्प्यते | iii.छात्राः श्लोकान् पठित्वा अर्थज्ञानं प्राप्नुयु: | iv.श्लोकसंबद्धकथानिर्माण सक्षमता |
क्रियाकलापः	i. छात्राः सर्वे गणान् कारयित्वा श्लोकान् कण्ठस्थी कृत्य कक्षायां स्व कण्ठाभरणं कुर्वन्ति | ii.अन्वयज्ञान प्राप्तये पदान् (क्रिया , कर्तृ पदान् चयनीय कार्यं कर्तव्यम्| iii. पूर्व अर्ध , उत्तर अर्ध इत्यनेन माध्यमेन छात्राणां कथनाय अवकाशः कल्प्यते |

शिक्षणाधिगमः	i. श्लोकानां भावबोधनम् ii. अन्वय ज्ञान कार्यम् iii. सन्धि विच्छेद ज्ञानम् iv. प्रश्ननिर्माण ज्ञानम् v. सुभाषित श्लोक संकलन पटुत्वम् vi. समाजे नीति बोधन कथन सक्षमता vii. भारतीय परम्परा गत रामायणादि संस्कृति सम्बद्ध विषय ज्ञानम्

1. १.श्लोक संपर्क सूत्रम् - shloka : Sanskrit Documents
Index of all Shlokas with Meaning Translation Lyrics and Audio (shlokam.org)
50+ sanskrit shloks with meaning, **प्रेरणादायक संस्कृत श्लोक** - Sanskrit School

क्रम संख्या	2
पाठः	नास्ति त्याग समं सुखम्
उपविषयः	बोधिसत्वस्य जीवन चरित्रम्

शिक्षणोद्देश्यम्	i.अस्य पाठस्य उद्देस्यं अस्ति यत् त्यागेन मनुष्यः जीवने सुख समृद्धिः प्रासुं शक्यते | ii..त्यागो नाम – दीनेभ्य: यत् दीयते । अन्येषां जीवनाय यत् आवश्यकं वर्तते , तत् दातव्यम् | iii.भारतीय संस्कृति परम्परायां अस्य विषयस्य कृते महान् उपकारः अस्ति | iv.सर्वत्र कथाभागेषु त्यागस्य महत्वम् , त्यागस्य आवश्यकता वर्णितः भवति
क्रियाकलापः	i.पाठं सम्यक् अधीत्य अभिनयः करणीयः | ii. कक्षायां पाठाधारित त्याग सम्बद्ध श्लोकाः भावार्थ पूर्वकं पठनीयाः | iii.कथा (पाठ) सम्बद्ध चित्राणि रचयित्वा वाक्यानि सम्स्कृते वक्तव्यानि |
शिक्षणाधिगमः	i.छात्राः पाठम् सम्यक् अधीत्य जीवने त्यागस्य आवश्यकतां अवगच्छन्ति | ii.अनेन पाठेन शरीरं अतिरिच्य देश सेवायाः प्रेरणा भवति | iii.पाठे विद्यमान श्लोकान् अधीत्य भावं अवगम्य समाजे छात्राः स्व योगदानं कर्तुं शक्यन्ते | iv.छात्राः त्यागसम्बद्ध श्लोकान् अवगत्य तद्वारा समाजे प्रवचन शक्ति क्षमतां

	प्राप्नुवन्ति | v.पाठे विद्यमान वाक्यानि अधीत्य व्याकरण रीत्या प्रश्ननिर्माण कार्यानि , कर्ता , कर्म , क्रिया चयनानि , कथा लेखन क्षमता च प्राप्यन्ते | vi.त्याग सम्बद्ध श्लोक संकलनेन भारतीय सम्स्कृति आधार ग्रन्थेषु प्रवेशःभवति

कथा सम्बद्ध सूत्रम् –

The 8 Great Bodhisattvas represent the 8 Great Qualities of Buddha; why we need these qualities to help heal the world - Buddha Weekly: Buddhist Practices, Mindfulness, Meditation

क्रम संख्या	3
पाठः	रमणीया हि सृष्टिः एषा
उपविषयः	समत्व भावबोधन पशुपक्षि कथांशः- (पञ्चतन्त्रात्)
शिक्षणोद्देश्यम्	i.सर्वे सदा समानाः | ii.परस्परं कलहः न भवेत् | iii.अहमेव सर्वथा श्रेष्ठ इति भावः असमीचीनम् अस्ति | एतद् अवबोधनाय पशु पक्षिद्वारा समाजस्य अवबोधनाय अनेन पाठेन भाव कथा नाठक द्वारा च प्रस्तुता

	| iv.प्रकृतिःभगवान् च सर्वेषु भूतेषु सर्वदा समदृष्टिः समभावःप्रदर्शितः | अयमेव लक्ष्यांशः भवति |
क्रियाकलापः	i.कक्ष्यायां पशु पक्षि वेषं धारयित्वा समत्व भाव बोधनाय लघु लघु वाक्यैः पाठस्थ वाक्यानि पठनीयनि | ii.कक्ष्यायां प्रश्ननिर्माण वाक्यानि कारयित्वा कः श्रेष्ठ इति प्रश्नं कृत्वा उत्तराणि करणीयानि | iii.पक्षि सम्बद्ध श्लोकाः वक्तव्याः|
शिक्षणाधिगमः	i. सर्वे समानाः इति भावप्रधानः अत्र भवति | ii . अत्र को$पि निम्नः नास्ति इति बोधः भवति | iii.पशु पक्षीणां कथा अवगन्तव्या भवति | iv.पक्षि सम्बद्ध श्लोकाः अवगन्तव्याः भवन्ति | v.साधारण वाक्यनिर्माण क्षमता च भवति | vi.पाठस्थ श्लोकावगमनेन भावबोधनावगमनं भवति |

	vii.प्रकृतिः सर्वदा सर्वान् उपकरोति इति अवगमनं भवति ।

सम्पर्क सूत्रम् –

The Adventures of Bird - Short Kid Stories

https://youtu.be/NHM2Hn-JeHw?si=NyUHesxCrV_YUL2L

गुरोः महत्त्वम्- https://youtu.be/0fI9AXuNImo?si=dsSMA5jeKlkGbvZw

क्रम संख्या	4
पाठः	आज्ञा गुरूणां हि अविचारणीया
उपविषयः	नीति-कथा

शिक्षणोद्देश्यम्	i. संस्कृत-साहित्य-विविधताया: विषये ज्ञानसंपादनम्। ii. संस्कृतकथाग्रन्थान् प्रति रुचेरुत्पादनम्। iii. संस्कृतवार्तालापस्य क्षमताया: उत्पादनम्। iv. गुरुजनान् प्रति आदरभाव:। v. कथाया: नाटकीकरणम्।
क्रियाकलापः	1. अभिनयनम् - i. कक्षाया: संख्यानुसारं छात्राणां गणनिर्माणम्। ii. प्रत्येकस्य पात्रस्य कृते छात्रचयनम्। (राजपुत्रा:-३, वानरा:-४, यूथप:-१ एवम्.....) iii. कथाया: परिवर्तनं नाटकरूपेन छात्रसाहाय्येन भवेत्। iv. ४-५ निमेषपर्यन्तं मञ्चनं भवेत। छात्राणां कृते अंका: अन्यगणै: देया:। 2. कथापूर्ति: / निर्माणं वा। i. पठितपाठस्य वा अन्यस्य वा कथानिर्माणम् / कथा पूर्ति:। ii. शिक्षक: कथां स्वीकृत्य तस्या: पात्राणां चित्रं / क्रीडनकं वा

	दर्शयित्वा संस्कृते नामानि पृच्छत।(एष: क: - नकुल: , एष: क: - सर्प: , एवम्...) iii. अनन्तरं लघुवाक्यनिर्माणं भवेत्। (नकुल: किं करोति – पुत्रं रक्षति , ब्राह्मण: किं करोति- राजगृहं गच्छति- एवं) iv. लघुवाक्यानां योजनं कृत्वा कथाया: पूर्ति: भवेत्।¥ मौखिक-लेखनरूपेण वा भवेत्)
शिक्षणाधिगमः	शिक्षणाधिगमः i. छात्रा: पाठं पठित्वा गुरुन् प्रति समादारभावं प्रकटयन्ति। ii. नाट्याभिनयेन वार्तालापक्रमे आरोह-अवरोहनपूर्वकं सरलसंस्कृते वार्तां कर्तुं प्रभवन्ति छात्रा:। iii. सामुहिक-कार्येण समाजे स्वकार्यमवगत्य सम्यक्तया कर्तुं प्रभवन्ति। iv. कथापूर्ति-माध्यमेन पूर्वपठितान् शब्दान् स्मृत्वा लघुवाक्यनिर्माणाय प्रयतन्ते छात्रा:।

गुरो: महत्त्वम्- https://youtu.be/0fI9AXuNImo?si=dsSMA5jeKlkGbvZw

क्रम संख्या	5
पाठः	अभ्यास वशगं मनः
उपविषयः	श्रीकृष्णार्जुनयो: मध्ये संवाद: (उपदेशः)
शिक्षणोद्देश्यम्	i. संस्कृत-साहित्य-नीतिग्रन्थानां विषये रुचेरुत्पादनम्। ii. भगवत्गीतां ज्ञानार्थं पठितुं छात्राणां मनसि उत्साहवर्धनम्। iii. संस्कृतवार्तालापस्य क्षमताया: उत्पादनम्। iv. मनस: वशीकरणाय योगाभ्यासस्य आवश्यकता। v. श्लोकानां नाटकीकरणम्।
क्रियाकलापः	1.वार्तालाप-लेखनम् / पूर्ति: वा। i. पाठस्य श्लोकान् अधिकृत्य श्री कृष्णार्जुनयो: मध्ये वार्तालापस्य लेखनम् भवेत्। ii. एतस्य मञ्चनमपि श्लोकरूपेण , वार्तालापरूपेण च भवितुमर्हति। (अर्जुन: - नमोनम: श्री कृष्ण! । श्रीकृष्ण:-नमोनम:। किमर्थं भवान् दु:खी?..एवं)

	2.क्रमेण लेखनम्। i. कक्षाया: संख्यानुसारं छात्राणां गणनिर्माणम्। ii. शिक्षका: वासराणाम्, विभक्तीनाम् ,शब्दरूपाणां वा कर्गतपत्रे अक्रमेण विलिख्य छात्राणां पुरत: स्थापयित्वा क्रमेण लेखनार्थं वदन्तु। (अस्मिन् पाठे यथा- काम: , क्रोध: , विनाश: , बुद्धिनाश: ,पञ्चेन्द्रियविषय: , संग: , संमोह: , बुध्दिनाश: , स्मृतिविभ्रम:... एतेषां क्रमेण लेखनम्) 3.स्वजीवने / चलचित्रे / पुराणे वा अस्य क्रमस्य(पञ्चेन्द्रियविषयत: विनाशपर्यन्तं) वर्णनं कुर्यात्। (यथा मम जीवने – पञ्चेन्द्रियविषय:- मह्यं मोदकं रोचते। संग:- प्रतिदिनं खादामि । काम:- अन्यत् नेच्छामि। क्रोध:- मम भ्राता मम मोदकं खादितवान् अत: अत: अहं क्रोधी। संमोह: - अहं किं कर्तव्यविमूढ:।

	स्मृतिविभ्रम:- अहं भ्राता इति विस्मृत्य तं ताडयामि। बुद्धिनाश:- तस्य रोदनं दृष्ट्वा अपि ताडयामि। विनाश: - एतत् दृष्ट्वा मम पितरौ माम् ताडयत:) एवं....
शिक्षणाधिगमः	छात्रा: पाठं पठित्वा मनस: वशीकरणाय विद्यालयप्रार्थना- इत्यादिनाम् आवश्यक्तां जानन्ति। i. नाट्याभिनयेन वार्तालापक्रमे आरोह-अवरोहनपूर्वकं सरलसंस्कृते वार्तां कर्तुं प्रभवन्ति छात्रा:। ii. श्लोकानां सम्यगुच्चारणं ज्ञास्यन्ति अर्थावगमनं च करिष्यन्ति छात्रा:। iii. स्वजीवन-घटनाया: विषये वदन्त: छात्रा: स्वस्य दोषान् अपि स्वीकरिष्यन्ति, पुन: च तान् निवारयन्ति। iv. क्रमेण लेखनेन उचितक्रमं ज्ञास्यन्ति छात्रा:।

अभ्यासवशगं मन: - https://youtu.be/9ux_TXd3cxM?si=b7FTqUWZQgCAC5EA

क्रम संख्या	6
पाठः	राष्ट्रं संरक्ष्यमेव हि
उपविषयः	आणविकास्त्राणां निषेध:।
शिक्षणोद्देश्यम्	i. संस्कृत-नाटकग्रन्थानां विषये रुचेरुत्पादनम्। ii. भारतीय-पुरातनविज्ञानपरप्पराया: विषये ज्ञानसंपादनम्। iii. संस्कृतवार्तालापस्य क्षमताया: उत्पादनम्। iv. पूर्वपाठानां संबद्ध: अत्र छात्रै: अवगन्तव्य: । (आज्ञा... पाठेन द्रोणाचार्यस्य वाचा एव अर्जुन: स्वास्त्रं प्रतिगृह्णाति , एवं अभ्यासवशगं मन: - पाठेन अश्वत्थामा मानवकल्याणाय अस्त्रं न त्यजति(मन: वशीकृतवान् अधुना इति) v. नाटकस्य अवगमनम् – अधुनतनकाले च तस्य उपयोग:।
क्रियाकलापः	1. अभिनयनम् - i. कक्षाया: संख्यानुसारं छात्राणां गणनिर्माणम्। ii. प्रत्येकस्य पात्रस्य कृते छात्रचयनम्। (श्री कृष्ण: , अर्जुन: , नारद: , द्रौपदी...)

	iii. नाटकस्य सरलीकरणम् अपि छात्रसाहाय्येन भवेत्। iv. ४-५ निमेषपर्यन्तं मञ्चनं भवेत। v. छात्राणां कृते अंका: अन्यगणै: देया:। ii.वाद-विवाद:।- विषय: - आणाविक-अस्त्राणां प्रयोग: सदुपयोगाय/ दुरुपयोगाय वा। iii.भारतस्य अस्त्राणां नामानि विलिख्य , चित्राणि च पेष्टिकृत्वा तेषां विषये पञ्च-पञ्च वाक्यानि लिखत। iv.नाटक-लेखनम्। एतं पाठं पठित्वा “पर्यावरणं संरक्ष्यमेव हि” “वृक्ष: संरक्ष्य: एव हि” “जलं संरक्ष्यमेव हि “ इत्यादि नाटकलेखनया छात्रगणं निर्मीय , शिक्षका: साहाय्यं कर्तुं शक्नुवन्ति।
शिक्षणाधिगमः	शिक्षणाधिगमः i. छात्रा: पाठं पठित्वा भारतीयज्ञान-विज्ञान-परंपराम् अवगमिष्यन्ति। ii. नाट्याभिनयेन वार्तालापक्रमे आरोह-अवरोहनपूर्वकं सरलसंस्कृते वार्तां कर्तुं प्रभवन्ति छात्रा:। iii. सामुहिक-कार्येण समाजे स्वकार्यमवगत्य सम्यक्तया कर्तुं

	प्रभवन्ति। iv. कथापूर्ति-माध्यमेन पूर्वपठितान् शब्दान् स्मृत्वा लघुवाक्यनिर्माणाय प्रयतन्ते छात्रा:। v. नाटक-लेखनात् छात्राणां लेखन-कल्पना-शक्ते: च विकास: भवति।

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क्रम संख्या	7
पाठः	साधुवृत्तिम् समाचरेत्
उपविषयः	i. जीवने प्रशस्तः मार्गः एव अनुसरणीयः इति नीति-आधारितः कथा रूपोऽयं गद्य पाठः | ii. संस्कृत-शिक्षा मञ्जरी द्वितीय भागात् संकलितः |
शिक्षणोद्देश्यम्	i. गद्य पाठ आधारित अंशाः | ii. शुद्धोच्चारणम्अवगमनं च। iii. जीवने यथोचितं पालनं च |

क्रियाकलापः	i. छात्र-द्वारा स्व व्यवहारे उचित-अनुचित कार्यस्य सूचि-निर्माणं , कक्षायां श्रावणम् | ii. उचित-कार्य करणे मनसि संतृप्तिः लभ्यते इति अर्थयुक्तः इतिहास विषय संग्रहः , सुभाषित संग्रहः , श्रेष्ठजन जीवनचरित्रं भित्तिपत्र रूपेण कक्षायां संस्थापनम् | iii. अस्याः कथायाः लघुनाटिका रूपेण रचनां कृत्वा प्रदर्शनम् | iv. पाठाधारेण प्रश्नोत्तरी ।
शिक्षणाधिगमः	i. छात्राः पाठं पठित्वा जीवनपथस्य विषये अवगमिष्यन्ति। ii. सरलसंस्कृते वार्तां कर्तुं प्रभवन्ति छात्राः। iii. सामुहिक-कार्येण समाजे स्वकार्यमवगत्य सम्यक्तया कर्तुं प्रभवन्ति। iv. कथापूर्ति-माध्यमेन पूर्वपठितान् शब्दान् स्मृत्वा लघुवाक्यनिर्माणाय प्रयतन्ते छात्राः। v. नाटक-लेखनात् छात्राणां लेखन-कल्पना-शक्तेः च विकासः भवति।

साधुवृत्तिम् समाचरेत्- https://youtu.be/KbhfpdNJXr0?si=HY0_tKozSfjkKAAS

क्रम संख्या	8
पाठः	तिरुक्कुरल सूक्ति सौरभम्
उपविषयः	i. उत्तम सुख जीवनाय वाक्यद्वये कथितः तिरुक्कुरल् श्लोक-संग्रह रूपोऽयं पद्य पाठः | ii. अति प्राचीन तमिल भाषायाः तिरुक्कुरल् साहित्यस्य विषये बोधनम्। आहत्य १३३० कुरल् इति अपि बोध्यम् ।
शिक्षणोद्देश्यम्	i. पद्य पाठ आधारित अंशाः | ii. शुद्धोच्चारणम् अवगमनं च। iii. जीवने यथोचितं पालनं च |
क्रियाकलापः	i. मातृ-पितृ भक्तिः , उत्तम चिन्तनं , कथनं , मधुर वाक्य प्रयोगः , विदुषां सम्मानं , तत्वार्थनिर्णयस्य महत्त्वं , श्रेयसः सुखप्राप्तेः रहस्यं , सदाचारस्य प्राधान्यम् - इति अष्ट सुवचनस्य स्वजीवने यथाशक्ति अनुकरणम् | ii. उपर्युक्त श्लोक अर्थयुक्तः इतिहास विषय संग्रहः , सुभाषित संग्रहः , श्रेष्ठजन जीवनचरित्रं भित्तिपत्र रूपेण कक्षायां संस्थापनम् |

	iii. सूक्ति विषयमाधृत्य कथा लघुनाटिका चित्र रचनां वा कृत्वा प्रदर्शनम् | iv. पाठाधारेण प्रश्नोत्तरी ।
शिक्षणाधिगमः	i. तमिल भाषायाः विशेषः। ii. तिरुवल्लुवर जीवन चरित्रम्। iii. कुरल द्वारा जीवनस्य सन्मार्ग प्रदर्शनम्। iv. कुरल ग्रन्थस्य कण्ठस्थी करणम् | v. सदाचारः, सत्यस्य महिमा ,मधुरा वाक् इत्यादीनां भावबोधनम् ।

सूक्तय: -

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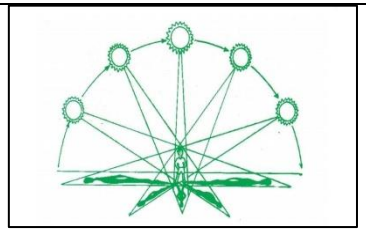
क्रम संख्या	9
पाठः	सुस्वागतं भोः अरुणाचले sस्मिन्
उपविषयः	पूर्वोत्तर-दिशि विद्यमान भारतस्य एव अद्वितीयभागस्य अरुणाचल प्रदेशस्य संस्कृति इतिहास भौगोलिक रीत्या माहात्म्यम् |
शिक्षणोद्देश्यम्	i. नाट्यांश पाठ आधारित शिक्षण - अंशाः | ii. शुद्धोच्चारणम् ,अवगमनं ,जीवने यथोचितं पालनं च |

क्रियाकलापः	i. मानचित्रे अरुणाचल प्रदेश विषये सूचना लेखनम् | ii. अरुणाचलप्रदेश राज्य मण्डल ग्राम नगर उत्सव नदी प्राकृतिक संपद् विवरणम् iii. तेषां नागरिकानां वस्त्र-नृत्य खाद्य-पान कलाचार विषये संकलनं चित्रैः सह | iv. पाठाधारेण प्रश्नोत्तरी ।
शिक्षणाधिगमः	i. अरुणाचल प्रदेश माहात्म्यम् | ii. नदीनाम् नामानि | iii. बौद्ध संप्रदाय कथा | iv. परशुराम कुण्डस्य महिमा | v. ओषधीनां नामनि vi. सरलसंस्कृत वाक्यानि vii. अरुणाचल प्रदेश विद्यमान विशेषांशः

अरुणाचल-यात्रा - https://youtu.be/GJ9wUxjxUsw?si=XIyF0cEvEPVdmPVG

क्रम संख्या	10
पाठः	कालोऽहम्
उपविषयः	 कालोऽहम्" शब्दस्यार्थः "अहम् समयः" तत्र समयस्य महत्त्वं च जीवने अन्यतमं अभिन्नं भागं अस्ति। परा इत्यादि काल अवबोधनम् ।
शिक्षणोद्देश्यम्	i. समयस्य प्रबंधनं। ii. समये सह सामग्र्याः संचित्य तथा अन्यायेन प्रयोगं कर्तुं कौशलम्। iii. कार्यक्रमाणां योजना। iv. समये नियत-कार्यक्रमाणां योजना संपादनं च। v. समयसारणीकरणम्। vi. किञ्चित् विशिष्टं कार्यक्रमं समये योजनां कृत्वा समयसारणीकरणम्।
क्रियाकलापः	1.समयसूची निर्माणम्। i. विद्यार्थिनः समयसूचीं सृजनं करोति, यां तेषां कार्यक्रमाणि

	समयगतानि संस्कार्यन्ते। ii. समयस्य प्रबन्धनं, समयस्य महत्त्वं, समयस्य उपयोगः इत्यादिषु विषयेषु च छात्राणां सम्यक्सम्यग्विचारं क्रियते। 2. समयप्रबंधनानुसार- खेलाः योजयन्ते, येषां च माध्यमेन समयप्रबंधनस्य शिक्षा दीयते। 3 .समयलेखनम् – दैनिककार्यक्रमान् समयानुसारं लेखनाया कथयन्ते। 4 .कोणार्क- मन्दिरस्य आनलाइन माध्यमेण यात्रा।
शिक्षणाधिगमः	i. अध्ययनसमये शास्त्रम्अध्येतव्यम्। ii. विश्रामःसमये विश्राम: कर्तव्य:। iii. संवादः:- समये संवादः , समये सहायतां कर्तुं च।

कोणार्कमन्दिरम् - https://youtu.be/dIva8tpBmBg?si=vvUfgy7jhKMyk6Jk

क्रम संख्या	11
पाठः	किम् किम् उपादेयम्

उपविषयः	 किम् किम् ग्राह्यम् किम् किम् च त्याज्यम्
शिक्षणोद्देश्यम्	i. ज्ञानस्य प्राप्तिः। ii. विचारस्य विकासः:- विविधा: प्रश्ना: छात्राणां विचारशक्तिं संपोषयन्ति। iii. सम्प्रेषणशक्तेः विकासः: - उत्तरदानेन छात्राणां संप्रेषणम्। iv. आत्मविश्वासस्य विकासः। v. विवेचनात्मक कौशलस्य प्रवर्धनम्:।
क्रियाकलापः	i. श्लोकम् प्रश्नोत्तरमाध्यमेन लिखन्तु। वार्तालापं च रचयन्तु। ii. क्रियाशब्दान् प्रयुज्य वाक्यानि रचयन्तु । iii. समूहचर्चा: छात्राः समूहे प्रश्नान् प्रश्निष्यन्ति एवं उत्तराणि ददति। iv. स्वतन्त्राभ्यासः: छात्राः प्रश्नोत्तरी माध्यमेन आत्मनिर्देशितं अभ्यासम् करोन्ति।

शिक्षणाधिगमः	i. छात्राः स्वयं प्रश्नान् प्रच्छन्ति एवं उत्तराणि च ददति। ii. छात्राणां विविधप्रकारेषु प्रश्नेषु बुद्धिमत्तायाः विकासः भवति। iii. प्रश्नोत्तरमाध्यमेण जीवनमार्गस्य पुनरावलोकनं क्रियते। iv. जीवनपथि उचितानुचितस्य ज्ञानं प्राप्नुवन्ति।

प्रश्नोत्तररत्नमालिका- https://youtu.be/7uq7TDhaCaI?si=pL_zACestyA1OTy_

SUBJECT: MATHS

CONTENTS

Activity: 1

Factor Factory

To find the LCM and HCF of numbers

Topic: Real Numbers

Objective: To explore the concepts of LCM and HCF through hands-on experimentation and collaboration.

Materials Needed:

Colored beads or cubes (different colors), Large sheets of paper or poster boards, Markers, Rulers

Preparation:

- Divide the class into small groups of 3-4 students each.
- Provide each group with coloured beads or cubes representing different numbers (e.g., red for 2, blue for 3, green for 5, etc.).

Setting Up the Factory:

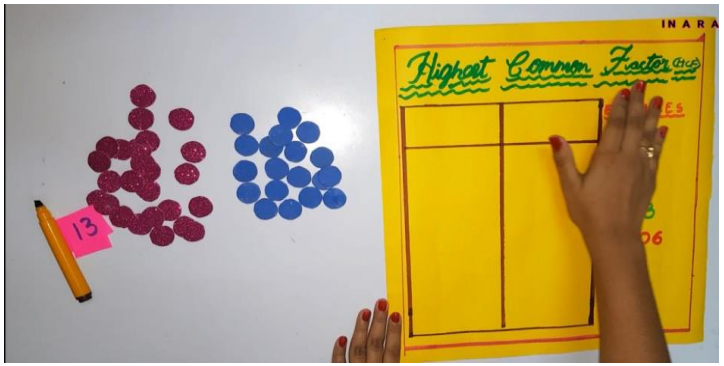
- Explain to students that they are going to create a "Factor Factory" where they will manufacture numbers using prime factors.
- Each group will have a large sheet of paper or poster board to represent their factory floor.

Manufacturing Numbers:

- Instruct students to start by placing the prime factors (coloured beads or cubes) on their factory floor.
- Encourage them to combine the prime factors to create different numbers. For example, if they have red (2) and blue (3), they can combine them to make 6.
- Students should work together to find as many combinations as possible, representing different numbers using prime factors.

Finding LCM and HCF:

- Once students have created several numbers using prime factors, introduce the concepts of LCM and HCF.
- Ask each group to identify the numbers they have created and find the LCM and HCF of those numbers.
- Encourage students to use their prime factorization skills to determine the LCM and HCF efficiently.



Discussion and Analysis:

- After finding the LCM and HCF of their numbers, facilitate a class discussion to compare the results among groups.
- Encourage students to explain their strategies for finding the LCM and HCF and discuss any patterns or relationships they observe.
- Emphasize the importance of prime factorization in determining LCM and HCF and how this activity relates to real-life scenarios.

Extension:

- For advanced students, challenge them to find the LCM and HCF of larger numbers or to create more complex number combinations using additional prime factors.

Benefits:

- This activity promotes hands-on learning and collaboration among students.

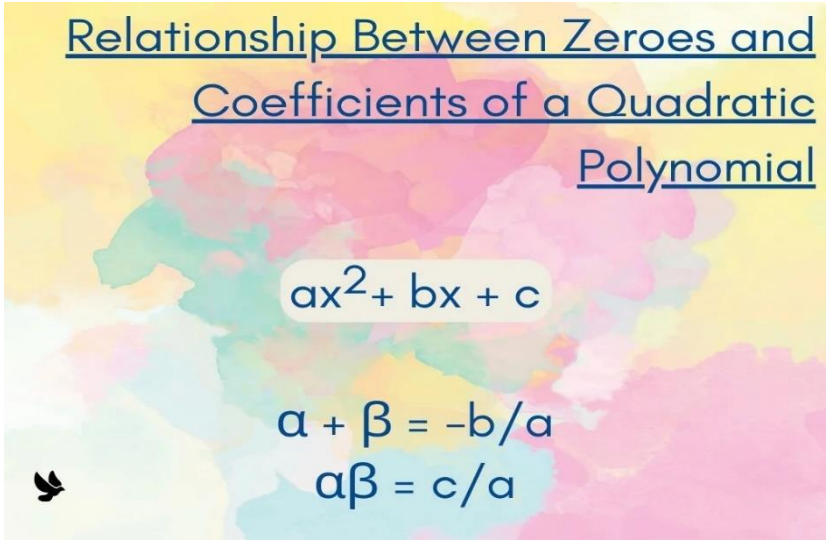
- It helps students visualize and understand the concepts of LCM and HCF using concrete manipulative.
- By engaging in the process of "manufacturing" numbers, students develop a deeper understanding of prime factorization and its role in determining LCM and HCF.

Activity-2

Relationship between Zeroes and Coefficients

Topic: Polynomials

Objective: To investigate the relationship between the zeroes and coefficients of a polynomial..



Materials Needed:

Whiteboard or chart paper

Markers

Polynomials with known zeroes and coefficients (prepared by the teacher)

Instructions:

Introduction:

- Begin by reviewing the concept of zeroes of a polynomial. Remind students that the zeroes of a polynomial are the values of the variable for which the polynomial equals to zero.
- Discuss the connection between the zeroes and the factors of the polynomial.

Activity Setup:

- Divide the class into small groups.
- Provide each group with a polynomial with known zeroes and coefficients. Alternatively, you can write different polynomial on the whiteboard or chart paper for the whole class to analyse together.

Analysing the Polynomial:

- Instruct students to analyse the polynomial provided to them. Encourage them to identify the zeroes and coefficients of each polynomial.
- Have students discuss within their groups how they can determine the polynomial using its zeroes.

Making Observations:

- After analysing the polynomial, facilitate a class discussion to share observations and insights.
- Ask students to identify any patterns or relationships they notice between the zeroes and the coefficients of the polynomial.

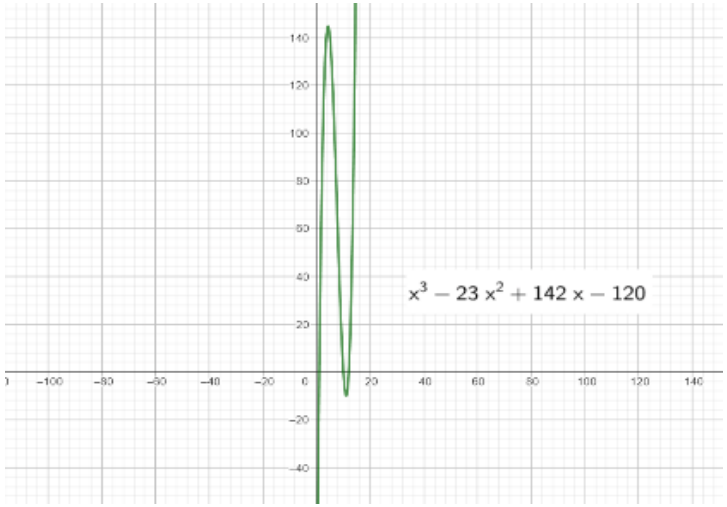
Exploring Vieta's Formulas:

- Introduce Vieta's formulas, which describe the relationship between the zeroes and the coefficients of a polynomial.
- Discuss how Vieta's formulas can be used to find the sum and product of the zeroes of a polynomial, as well as other relationships between the zeroes and coefficients.

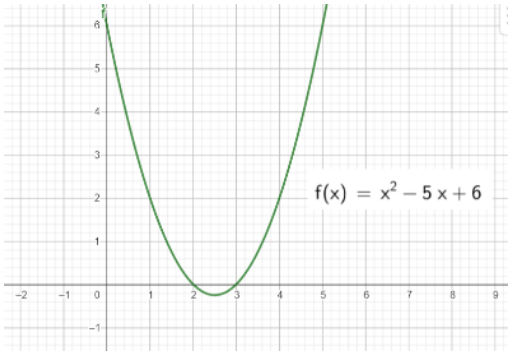
Application and Practice:

- Provide additional polynomial for students to practice applying Vieta's formulas.
- Encourage students to use Vieta's formulas to verify their observations and predictions about the relationship between the zeroes and coefficients.

Extension:



- For advanced students, challenge them to derive Vieta's formulas using algebraic manipulations and properties of polynomial.



Benefits:

- This activity promotes active engagement and collaborative learning as students work together to analyse polynomial.
- It helps students deepen their understanding of the relationship between the zeroes and coefficients of a polynomial.

- By exploring Vieta's formulas, students gain insight into the connections between algebraic concepts and develop problem-solving skills in polynomial..

To find out the number of zeroes of a polynomial by looking at its representation on Cartesian plane

Activity - 3

Escape Room - System of Equations Edition

Topic: A Pair of linear equations in two variables

Objective: To solve a series of linear equations in two variables to unlock clues and "escape" the room.

Materials Required:

Printed worksheets with sets of linear equations (enough copies for each group)

Marker pens, Stopwatch or timer, Envelopes containing clues (optional), Locked box or container (optional)

INTRODUCTION

- Explain to students that they are participating in an "Escape Room" activity where they must solve a series of puzzles to find clues and escape the room.
- Divide the class into small groups (3-4 students per group).

Setting the Scene:

- Create a story or scenario for the escape room setting. For example, students could be trapped in a math-themed laboratory and must solve equations to unlock the door.
- Set up the classroom with decorations or props to match the theme (optional but adds to the immersion).

Solving Equations:

- Provide each group with a worksheet containing sets of linear equations in two variables.
- Instruct students to work together to solve each set of equations using methods such as substitution, elimination, or graphing.
- Emphasize the importance of teamwork, communication, and problem-solving skills.

Unlocking Clues:

- Hide clues or pieces of a puzzle around the room or in envelopes placed in designated locations.
- Each time a group successfully solves a set of equations, they receive a clue that helps them progress through the escape room.
- The clues could be numerical codes, riddles, or symbols that need to be decoded.

Time Limit:

- Set a time limit for the activity (e.g., 30-60 minutes) to create a sense of challenges.
- Use a stopwatch or timer to keep track of the time.

Escaping the Room:

- As groups solve equations and gather clues, they paste together the information to unlock the final puzzle or combination lock.
- The first group to unlock the final puzzle "escapes" the room and wins the game.

Reflection and Discussion:

- After the activity, facilitate a debriefing session where students discuss their problem-solving strategies, challenges faced, and lessons learned.
- Discuss the connections between the linear equations they solved and real-life scenarios where systems of equations are used.

Benefits:

This activity promotes collaboration, critical thinking, and problem-solving skills.

It provides a fun and engaging way for students to practice solving systems of linear equations.

By incorporating a narrative and immersive setting, the activity increases student motivation and involvement in the learning process.

FOR REFERENCE: (A pair of linear equations in two variables can be solved geometrically with the following activity. Go through the link https://www.youtube.com/watch?v=BRPNfG0ygnM)

ACTIVITY - 4

OBJECTIVE

To verify the conditions of consistency/ inconsistency for a pair of linear equations in two variables by graphical method.

MATERIAL REQUIRED

Graph papers, pencil, eraser, cardboard, glue.

METHOD OF CONSTRUCTION

1. Take a pair of linear equations in two variables of the form

$a_1x + b_1y + c_1 = 0$ (1)

$a_2x + b_2y + c_2 = 0$, (2)

where a_1, b_1, a_2, b_2, c_1 and c_2 are all real numbers; a_1, b_1, a_2 and b_2 are not simultaneously zero.

There may be three cases :

Case I : $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

Case II: $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Case III: $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

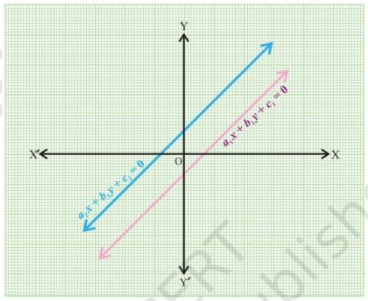


Fig. 3

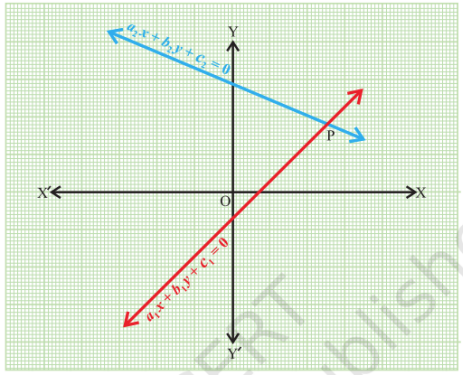
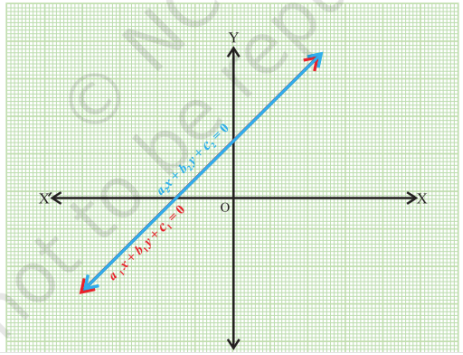


Fig. 1



2. Obtain the ordered pairs satisfying the pair of linear equations (1) and (2) for each of the above cases.

3. Take a cardboard of a convenient size and paste a graph paper on it. Draw two perpendicular lines X′OX and YOY′ on the graph paper (see Fig. 1). Plot the points obtained in Step 2 on different cartesian planes to obtain different graphs [see Fig. 1, Fig. 2 and Fig

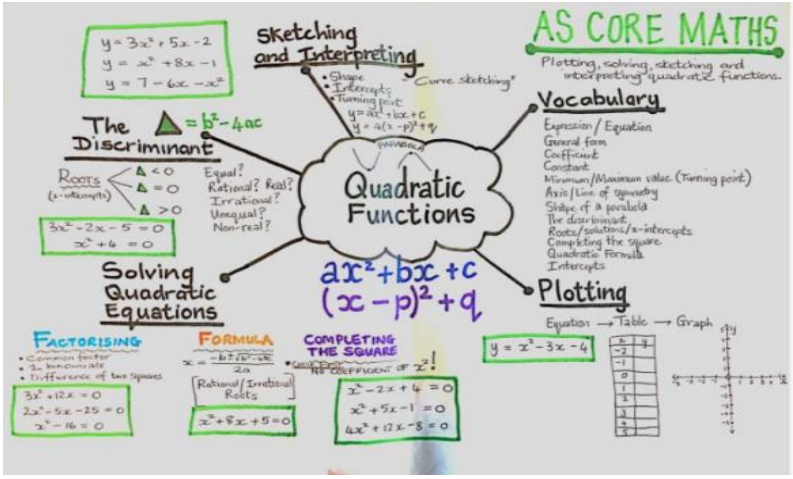
Activity - 5

Quadratic Roots Gallery Walk

$\frac{a_1}{a_2}$	$\frac{b_1}{b_2}$	$\frac{c_1}{c_2}$	Case I, II or III	Type of lines	Number of solution	Conclusion Consistent/ inconsistent/ dependent

Topic: Quadratic Equations

Objective: To investigate the nature of roots of quadratic equations through visual representations and hands-on exploration.



Materials Needed:

Large sheets of poster paper or whiteboards (enough for each group)
Markers, Quadratic equation cards (prepared by the teacher)
Colored pencils or markers, Graphing calculators or access to online graphing tools

Preparation: Write several quadratic equations on separate sheets of poster paper or whiteboards, leaving space for students to work and make notes.

- Create quadratic equation cards containing different sets of coefficients *a, b*, and *c.*

Setting Up the Gallery:

- Hang the poster papers or whiteboards around the classroom, creating a "gallery" of quadratic equations.
- Place the quadratic equation cards at each station.

Exploration Phase:

- Divide the class into small groups and assign each group to a starting station in the gallery.
- Instruct students to choose a quadratic equation card from the station and use it to solve the equation, determining the nature of its roots.

- Encourage students to graph the equation on graphing calculators or online graphing tools to visualize the parabola and its roots.
- Have students annotate their graphs to indicate the roots and any other relevant information.

Gallery Walk:

- After a designated time, instruct groups to rotate to the next station in the gallery.
- At each station, students analyse a new quadratic equation, repeating the process of solving, graphing, and annotating.
- Encourage students to compare and contrast the characteristics of the equations they encounter, noting any patterns or trends.

Discussion and Analysis:

- Reconvene the class after the gallery walk and facilitate a discussion on the nature of roots observed in the quadratic equations.
- Use the visual representations created by students to guide the discussion and reinforce key concepts.
- Encourage students to share their observations, identify patterns, and make connections between the coefficients of the equations and the characteristics of their graphs.

Extension Activities: Challenge students to create their own quadratic equations with specific characteristics (e.g., real and equal roots, complex roots, etc.) and share them with the class.

- Have students explore real-world applications of quadratic equations and discuss how the nature of roots relates to these scenarios.

Conclusion:

- Conclude the activity by summarizing the key concepts learned about the nature of roots of quadratic equations.
- Encourage students to reflect on their understanding and consider how they can apply it to solve problems in mathematics and beyond.

Benefits:

- This activity encourages active exploration and visual representation, making abstract concepts more tangible and accessible to students.
- It promotes collaborative learning as students work together to analyse quadratic equations and discuss their findings. By engaging in hands-on graphing and annotation, students develop a deeper understanding of the relationship between coefficients and the nature of roots in quadratic equations.

Activity – 6 Topic: Arithmetic Progressions

Objective

To identify Arithmetic Progressions in some given lists of numbers (patterns).

Material Required

Cardboard, white paper, pen/pencil, scissors, squared paper, glue.

Method of Construction

1. Take a cardboard of a convenient size and paste a white paper on it.
2. Take two squared papers (graph paper) of suitable size and paste them on the cardboard.

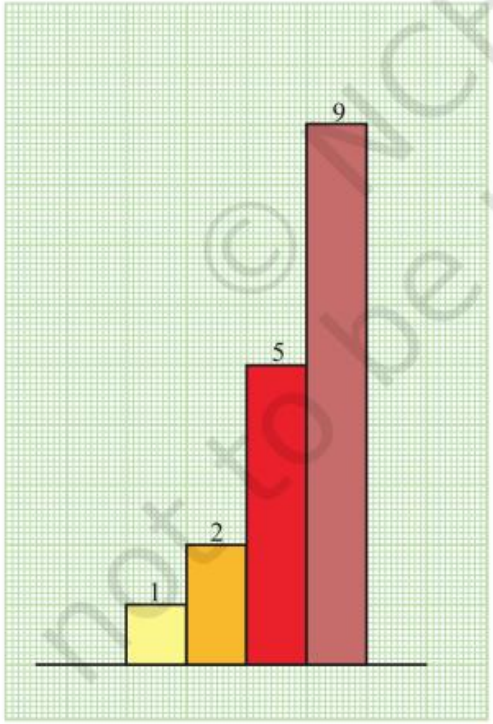


Fig. 1

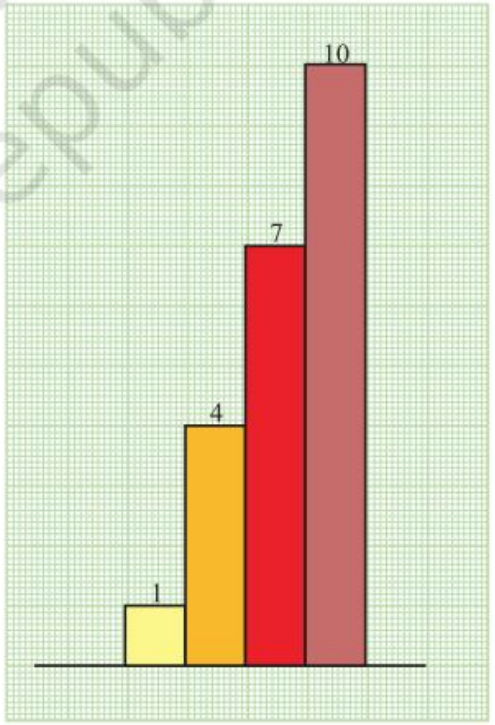


Fig. 2

3. Let the lists of numbers be (i) 1, 2, 5, 9, ... (ii) 1, 4, 7, 10, ...

4. Make strips of lengths 1, 2, 5, 9 units and strips of lengths 1, 4, 7, 10 units and breadth of each strip one unit.

5. Paste the strips of lengths 1, 2, 5, 9 units as shown in Fig. 1 and paste the strips of lengths 1, 4, 7, 10 units as shown in Fig. 2.

DEMONSTRATION

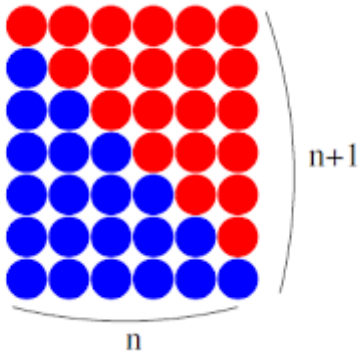
1. In Fig. 1, the difference of heights (lengths) of two consecutive strips is not same (uniform). So, it is not an AP.

2. In Fig. 2, the difference of heights of two consecutive strips is the same (uniform) throughout. So, it is an AP.

Activity – 7

Building the Sum of Natural Numbers

Objective: To help students understand the concept of the sum of the first *n* natural numbers and derive the formula using a hands-on approach.



Materials Needed:

Counting blocks or small objects (e.g., cubes, beans, buttons)

Large grid paper or whiteboard, Markers, Calculators (optional)

Instructions:

- **Introduction:**
  - Begin by discussing the concept of the sum of the first n natural numbers ($1+2+3+\ldots+n$) with the students.
  - Explain that the goal of the activity is to discover a formula for finding this sum without having to add up all the individual numbers.
- **Building the Sum:**
  - Distribute the counting blocks or small objects to the students.
  - Ask each student to represent the first n natural numbers using the counting blocks. For example, if $n=5$, students would use 5 counting blocks.
  - Have students arrange the counting blocks into a staircase pattern on the large grid paper or whiteboard, with the first row containing 1 block, the second row containing 2 blocks, and so on, until reaching the nth row containing n blocks.
  - Encourage students to count the total number of blocks used and record this number.
- **Discovering the Pattern:**
  - Guide students to observe the pattern formed by the arrangement of the counting blocks.
  - Ask probing questions to help students recognize that the pattern resembles a rectangle with dimensions n (base) and $n+1$ (height).
  - Discuss how the total number of blocks used represents the sum of the first n natural numbers.
- **Deriving the Formula:**
  - Guide students through the process of deriving the formula for the sum of the first n natural numbers using the pattern they observed.
  - Encourage students to express the sum as the area of the rectangle (base n times height $n+1$).
  - Help students simplify the expression and arrive at the formula $\frac{n(n+1)}{2}$
- **Verification and Application:**
  - Use calculators (if available) to verify the formula by calculating the sum for various values of n and comparing the results.
  - Discuss real-world applications of the formula and how it can be used to solve problems involving sequences and series.
- **Reflection:**
  - Conclude the activity with a reflection session where students discuss their insights, challenges faced, and key takeaways from the activity.
  - Encourage students to relate the concept of the sum of natural numbers to other mathematical concepts they have learned.

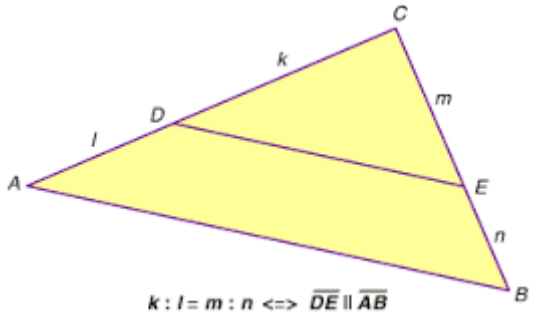
Benefits:

- This activity promotes hands-on exploration and visual representation, making abstract concepts more concrete and tangible for students.
- It encourages critical thinking and problem-solving skills as students discover and derive the formula for the sum of natural numbers.
- By connecting mathematical concepts to real-world scenarios, the activity helps students develop a deeper understanding of the relevance and applications of mathematics.

Activity - 8

Exploring Proportions in Similar Triangles

Objective: To investigate the Basic Proportionality Theorem and understand the relationship between parallel lines and sides of similar triangles.



Materials Needed: Paper or cardboard, Ruler, Pencil, Scissors, Colored markers or pencils

Instructions:

Introduction:

- Begin by introducing the concept of similar triangles and reviewing the properties of parallel lines.
- Explain that the Basic Proportionality Theorem states that if a line is parallel to one side of a triangle and intersects the other two sides, it divides those sides proportionally.

Activity Setup:

- Distribute materials to students and divide them into small groups.

- Instruct each group to create two similar triangles on separate pieces of paper or cardboard. They can use rulers and pencils to draw the triangles.
- Label the vertices of the triangles and mark corresponding sides with matching letters (e.g., side AB corresponds to side DE).

Exploration Phase:

- Ask each group to draw a line parallel to one side of their triangle, intersecting the other two sides.
- Have students measure the lengths of the segments formed on the intersected sides and record their measurements.
- Encourage students to observe any patterns or relationships between the lengths of the segments.

Discussion:

- Facilitate a class discussion on the observations made by the groups.
- Guide students to recognize that the lengths of the segments on the intersected sides are proportional to the lengths of the corresponding sides of the triangles.
- Introduce the Basic Proportionality Theorem and explain how it applies to the segments formed by parallel lines intersecting similar triangles.

Extension Activities:

- Challenge students to prove the Basic Proportionality Theorem using geometric reasoning and the properties of similar triangles.
- Provide additional examples of similar triangles and parallel lines for students to explore and apply the theorem.
- Have students create their own geometric constructions or diagrams to illustrate the theorem and present them to the class.

Application:

- Discuss real-world applications of the Basic Proportionality Theorem, such as using similar triangles to determine heights or distances in geometry and engineering.
- Encourage students to apply the theorem to solve practical problems and analyse geometric relationships in various contexts.

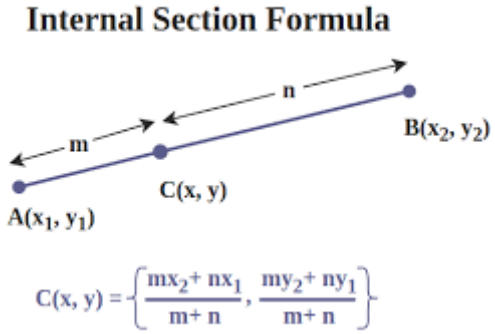
Benefits:

- This activity promotes hands-on exploration and visual representation, making abstract concepts more tangible and accessible to students.
- It encourages collaborative learning as students work together to investigate and discuss geometric properties.
- By connecting mathematical concepts to real-world scenarios, the activity helps students develop a deeper understanding of the relevance and applications of geometry.

Activity – 9

Exploring the Section Formula

Objective: To investigate the Section Formula and understand how it divides a line segment in a given ratio.



Materials Needed:

Large grid paper or whiteboard, Markers or colored pencils
Ruler, Scissors (optional), Cardstock or construction paper (optional)

Instructions:

Introduction:

- Begin by reviewing the concept of coordinate geometry and the Cartesian coordinate system with the students.
- Introduce the Section Formula, which calculates the coordinates of a point that divides a line segment in a given ratio.

Activity Setup:

- Draw a pair of coordinate axes (x-axis and y-axis) on the grid paper or whiteboard.
- Choose two distinct points A and B with known coordinates on the grid, representing the endpoints of a line segment.

Exploration Phase:

- Ask students to select a ratio *m*:*n* that will divide the line segment AB.

- Instruct students to use the Section Formula to calculate the coordinates of the point P that divides the line segment AB in the given ratio.
- Have students plot the points A, B, and P on the coordinate axes and connect them to form the line segment APB.
- Encourage students to measure the lengths of the segments AP, PB, and AB using a ruler.

Discussion and Analysis:

- Facilitate a class discussion on the observations made by the students.
- Guide students to compare the lengths of the segments AP, PB, and the original line segment AB.
- Discuss how the coordinates of point P relate to the ratio m:n and the coordinates of points A and B.

Extension Activities:

- Challenge students to explore different ratios m:n and observe how they affect the division of the line segment AB.
- Have students investigate special cases, such as when $m=n$ (which divides the line segment into two equal parts) or when one of the ratios is zero (which places the point P at one of the endpoints).

Visual Representation (Optional):

- For a more tactile experience, students can create a paper model of the line segment APB using cardstock or construction paper.
- They can cut out the shapes of points A, B, and P and arrange them on a paper strip to represent the line segment, with lengths proportional to the coordinates calculated using the Section Formula.

Application:

- Discuss real-world applications of the Section Formula, such as determining the coordinates of points that divide a line segment representing a road, a fence, or a building in a given ratio.
- Encourage students to apply the Section Formula to solve practical problems involving coordinate geometry.

Benefits:

- This activity promotes hands-on exploration and visual representation, making abstract concepts more tangible and accessible to students.
- It encourages collaborative learning as students work together to investigate and discuss geometric properties.
- By connecting mathematical concepts to real-world scenarios, the activity helps students develop a deeper understanding of the relevance and applications of coordinate geometry.

INTRODUCTION TO TRIGONOMETRY

TOPIC : TRIGONOMETRIC IDENTITIES.

Activity 10

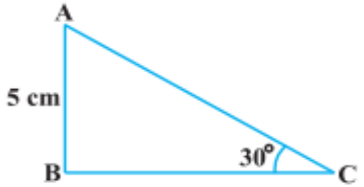
Objective:

To verify through an activity the Trigonometric Identities.

Materials required: - Pencil, Scale, Protractor, colour paper, chart paper, scissors etc.

Previous knowledge required: - Trigonometric Ratios in terms of the sides of a right triangle. Pythagoras Theorem.

Procedure: - Right triangles of different size are drawn with different coloured papers and pasted on a white chart paper with sides like (5cm,12cm,13cm.) etc.



Students measure length of each side of the triangles and place the data in the table. Repeat for different triangles.

$$\sin\theta = \frac{opp.side}{Hypotenuse} \quad , \qquad Cos\,\theta = \frac{Adj.side}{Hypotenuse}$$

SL.No	AB	BC	AC	$\left(\frac{AB}{AC}\right)^2$	$\left(\frac{BC}{AC}\right)^2$	$\left(\frac{AB}{AC}\right)^2+\left(\frac{BC}{AC}\right)^2$
1	5	12	13	$\frac{25}{169}$	$\frac{144}{169}$	$\frac{169}{169}=1$
2						

3						

Integration of Art :- Students use their artistic skill of drawing and cutting of colour paper. Neatly paste the work on a chart paper.

Students repeat the activity for another triangles and record their observations. The lengths of sides of the triangles and the angles measured are compared and studied properly and a discussion is initiated among the students.

Observation: -

Students after careful study come to know that

$$\frac{25}{169}+\frac{144}{169}+\frac{169}{169}=1$$

$$\sin^2\theta+\cos^2\theta=1$$

Similarly, students verify the other Trigonometric Ratios.

Application: The verified Trigonometric ratio is used in solving equations with trigonometry.

TOPIC: INTRODUCTION TO TRIGONOMETRY

CONCEPT AREA : TRIGONOMETRIC RELATIONS.

Activity 11

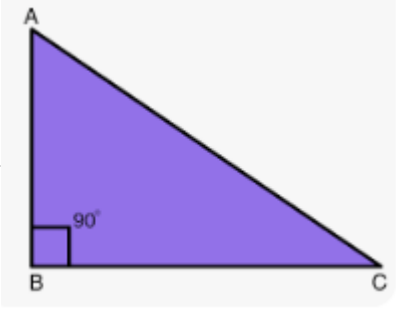
To verify the Trigonometric Relation $\frac{1}{\sin\theta}=\operatorname{cosec}\theta, \frac{1}{\tan\theta}=\cot\theta$

Previous knowledge required :- Trigonometric Ratios in terms of the sides of a right triangle. Pythagoras Theorem.

Procedure :- Right triangles of different size are drawn with different coloured papers and pasted on a white chart paper.

Students in a right triangle find the ratio of the sides.

Sin C, Cos C, Tan C , Cosec C, Sec C, Cot C



$\sin c = \frac{AB}{AC}$ and $\frac{1}{\sin c} = \frac{AC}{AB}$ $\operatorname{cosec} c = \frac{AC}{AB}$

Students verify all the trigonometric ratios

Integration of Art: - Students use their artistic skill of drawing and cutting of colour paper. Neatly paste the work on a chart paper.

Students repeat the activity for other triangles and record their observations. The lengths of sides of the triangles and the angles measured are compared and studied properly and a discussion is initiated among the students.

Observation:

Students after careful study get the clear idea of the different trigonometric ratios and their relations.

Application:

The verified Trigonometric ratio is used in solving equations with trigonometry.

CHAPTER: APPLICATIONS OF TRIGONOMETRY

CONCEPT AREA: APPLICATIONS OF TRIGONOMETRY

ACTIVITY - 12

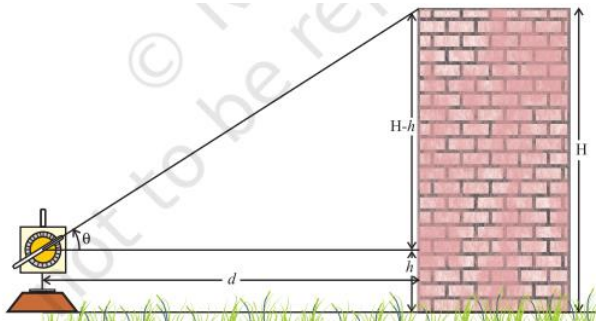
Objective of Activity:

To Estimate the height of a FLAG POST in the playground through an activity the Application of Trigonometry.

Materials Required: Measuring Tape (long), Clinometer, Pencil, Scale, Protractor, colour paper, chart paper, scissors etc.

Previous knowledge required: Trigonometric Ratios in terms of the sides of a right triangle. Values of Trigonometric Ratios for angles.

Procedure: The problem of real time situation is brought to be represented on paper diagrammatically. Students are taken to the playground . They represent their problem diagrammatically as shown.



A group of students measure the distance between the Flag Post or wall and the position of clinometer. Another group of students measure the angle between the horizontal and the top of the post using the clinometer.(clinometer position is so adjusted to obtain a standard angle 30^0 60^0 etc) the measured data is placed in the table .Repeated measurements are taken for accuracy.

$$\sin\theta = \frac{opp.side}{Hypotenuse} \quad , \quad Cos\,\theta = \frac{Adj.side}{Hypotenuse} \quad , \quad \tan\theta = \frac{Opp.Side}{adjacent.Side}$$

SL. No	Distance between the post and clinometer(D)	Angle θ	$\tan\theta$	Height of the Post =$\tan\theta$ X D
1				
2				
3				

Integration of Art: - Students use their artistic skill in the proper representation of the real time problem. Neatly paste the work on a chart paper.

Students repeat the activity for another repeated measurements and record their observations. A discussion is initiated among the students.

Observation:

Students after careful study, calculate the Height of the Flag Post as the Height calculated + Height of the clinometer position.

Similarly, students verify the other Trigonometric Ratios.

Application:

Students be able to measure the height of tower, Hills etc. which are really tough real time problems.

CHAPTER: APPLICATIONS OF TRIGONOMETRY

CONCEPT AREA : APPLICATIONS OF TRIGONOMETRY IN DIFFERENT AREAS

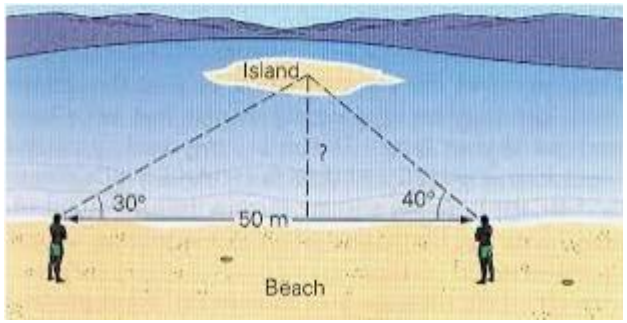
ACTIVITY 13

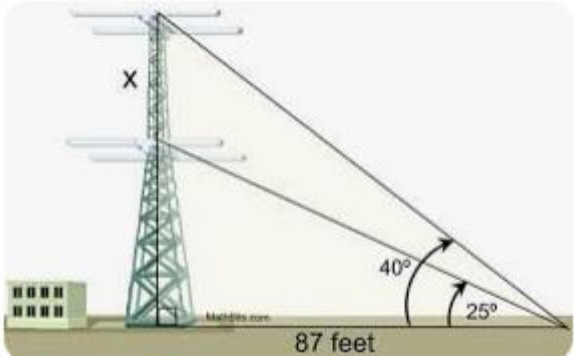
OBJECTIVE:

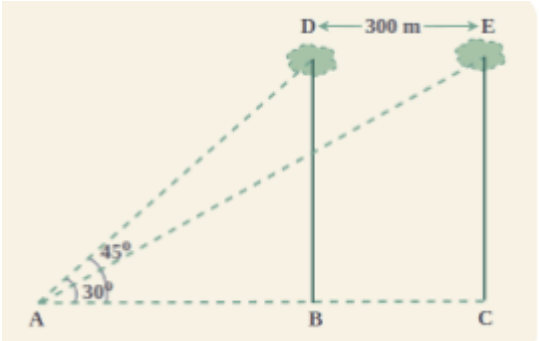
To understand and highlight the use of trigonometry in different areas of life through an activity.

Previous knowledge required: Trigonometric Ratios in terms of the sides of a right triangle. Values of Trigonometric Ratios for angles. Applications of trigonometry.

Procedure: The problem of real time situation is brought to be represented on paper diagrammatically. Students identify the various situations where trigonometry is used to solve the real life problems. They represent their problem diagrammatically as shown.







Students are asked to classify area wise uses of trigonometry

Integration of Art: Students use their artistic skill in the proper representation of the real time problem. Neatly paste the work on a chart paper.

Students explores in various ways to get the uses of trigonometry. A discussion is initiated among the students.

Application:

Students be able to use the concept of trigonometry to measure the height of tower, Hills etc. which are really tough real time problems.

Chapter: CIRCLES

Activity 14

The tangent at any point to a circle is perpendicular to the radius through the point of contact

Objective:

To verify through an activity that the tangent at any point o a circle is perpendicular to the radius through the point of contact.

Materials Required:

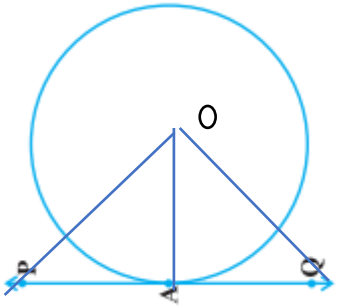
Coloured chart paper, wooden scale, geometry box, cardboard, chart board, Protractor.

Method of Construction:

1. A circle of a suitable radius is cut with a card board. It is placed on a chart board. Using a long scale, a long line is drawn. Three sticks of different lengths are placed (Pasted) from the centre to touch the scale representing the line .Out of these one is to touch the point of contact as shown below.

2. Take points P, A and Q as shown and place the sticks from the centre. OP, OA,OQ`
3. Observe the arrangement and measure the data and tabulate.

SL. No	Stick	Length	Angle made by the stick with the tangent stick
1	OP	…….	……..
2	OA	……..	……..
3	OQ	…….	……..



The lengths and the angles measured are compared and studied properly and a discussion is initiated among the students.

OP > OA

OQ > OA

OA is the shortest of all the line segments to the line PQ from the point O.

OBSERVATION:

Thus, from the activity it is concluded that the tangent is ..... to the radius through the point of contact.

APPLICATION:

This result “The tangent at any point to a circle is perpendicular to the radius through the point of contact” can be used in proving various other results of geometry.

TOPIC – CIRCLES

LENGTHS OF TANGENTS FROM EXTERNAL POINT

Activity – 15

Objective:

To verify through an activity that the length of tangents to a circle from an external point are equal. This activity allows students to explore the concept of equal tangents.

Materials Required: Large sheet of paper (chart paper or butter paper), card board, long straight rods

Preparation:

Teacher asks the students to draw a circle on the paper. Decide on a radius and clearly mark it. Label the strips "Tangent A" and "Tangent B" in different colors.

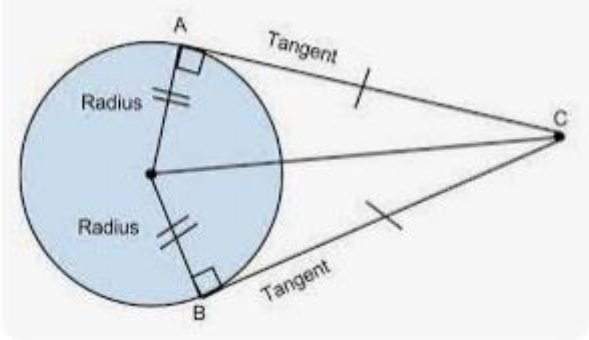
Activity:

Divide the class into two teams - Team A and Team B.

Pin the circle on the board or wall or on the note book.

Ask a student from Team A to stand at a point outside the circle (the "external point"). This point should be far enough from the circle so that it's clear both tangents can be drawn.

Instruct the student to hold the end of Tangent A at the external point and then touch the circle with the strip only once, making sure it's perpendicular to the point of contact (touching). This creates a tangent line. The student marks the point of contact on the paper with their team's colored marker. Once both tangents are drawn, measure the lengths of Tangent A and Tangent B using rulers. Repeat this for two more circles of different radius



Discussion:

Ask students to compare the lengths of the tangents. Are they the same?

Relate this activity to the concept of tangents drawn from an external point to a circle having equal lengths.

Discuss why this might be true (vaguely mention right triangles formed with the radius) and how it can be proven mathematically

Variations:

Have students repeat the activity from different external points (maintaining a good distance from the circle).

Challenge students to predict the tangent lengths before measuring.

Let students compete for the "most accurate tangent" (based on perpendicularity and minimal contact area).

CHAPTER: Areas Related to Circles

CONCEPT AREA: Area of a Sector

Activity – 16

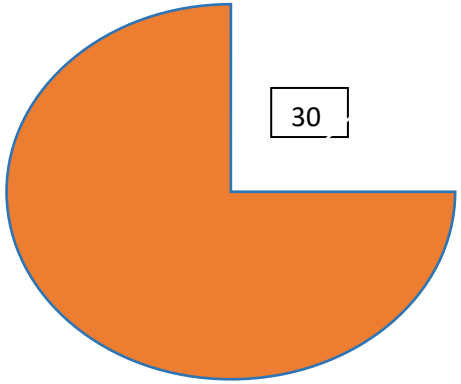
Objective:

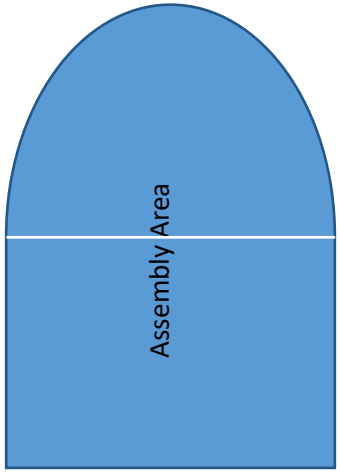
To calculate the area of sector of a circle through an activity.

Materials Required: Measuring Tape, Pencil, Scale, Protractor, colour paper, chart paper, scissors etc.

Previous knowledge required: Knowledge about the parts of circle, area of a circle, measuring angles, sum of the angles of a triangle and angles at a point.

Procedure: In the circular shaped playground, a part(one fourth of the ground) has been occupied temporarily for sports store. The students want to calculate area of playground available to play now. The problem of real time situation is brought to be represented on paper diagrammatically. Students are taken to the playground .They represent their problem diagrammatically as shown.





A group of students get the measurement of radius of the field. The other group of students measure the length of the side of the square playground. Measured data is placed in the table .Repeated measurements are taken for accuracy.

$$\text{Area of circle} = \pi r^2$$

$$\text{Part of play ground not available} = \frac{1}{4} \text{ of area of circle}$$

$$= \frac{1}{4} \text{ X } \pi r^2$$

$$\text{Part of playground available} = \frac{3}{4} \text{ of area of circle}$$

$$= \frac{3}{4} \text{ X } \pi r^2$$

A group of students get the measurement of the length and breadth of the prayer ground.

Area of assembly area with playground=Area of rectangle +

Area of semi-circle

$$= l \text{ X } b + \frac{1}{2} \pi r^2$$

Integration of Art: Students use their artistic skill in the proper representation of the real time problem. Neatly paste the work on a chart paper.

Students repeat the activity for another repeated measurements and record their observations. A discussion is initiated among the students.

Observation:-

Students after careful study, calculate the Area of the Assembly area and the playground.

Application:-

Students be able to measure the areas on ground, floor etc.

CHAPTER : Areas Related to Circles

CONCEPT AREA : Area of a Sector

Activity – 17

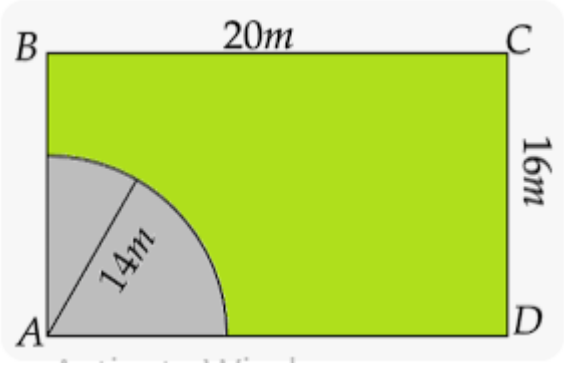
Objective of Activity:-

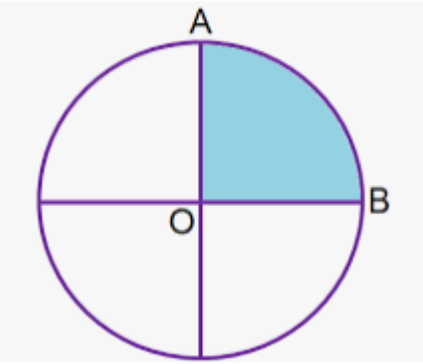
To calculate the area of sectors formed at the vertices of a quadrilateral through an activity.

Materials required: - Pencil, Scale, Protractor, colour paper, chart paper, scissors etc.

Previous knowledge required: - Knowledge about the parts of circle, area of a circle, measuring angles, sum of the angles of a triangle, quadrilateral and angles at a point.

Procedure: - In the rectangular shaped playground, sectors of same radius have been marked temporarily for another purpose. The students want to calculate area of playground available to play now. The problem of real time situation is brought to be represented on paper diagrammatically. Students are taken to the playground .They represent their problem diagrammatically as shown.





A group of students get the measurement of radius of the field. Another group of students measure the length and breadth of the playground. Measured data is placed in the table .Repeated measurements are taken for accuracy.

Area of circle = πr^2

Part of playground not available = $\frac{1}{4}$ of area of circle X 4

$$= \frac{1}{4} \pi r^2 \text{ X } 4$$

$$= \pi r^2$$

Part of playground not available to play = area of circle

Area of the playground available to play =Area of the square - πr^2

Integration of Art: - Students use their artistic skill in the proper representation of the real time problem. Neatly paste the work on a chart paper.

Students repeat the activity for another repeated measurements and record their observations. A discussion is initiated among the students.

Observation:-

Students after careful study, calculate the Area of the playground available for playing.

Application:-

Students be able to measure the areas related to circles.

CHAPTER: SURFACE AREAS AND VOLUMES

CONCEPT AREA: SURFACE AREA OF COMBINATION OF SOLIDS

Activity – 18

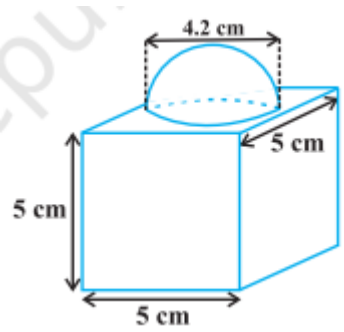
Objective of Activity:-

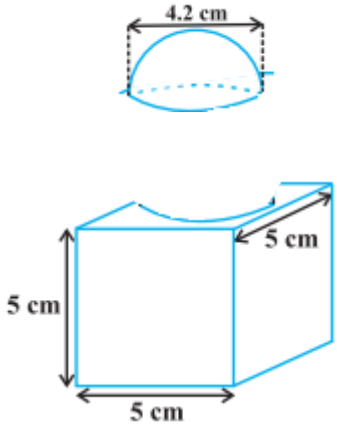
To Calculate the Curved Surface Area of a solid through an activity.

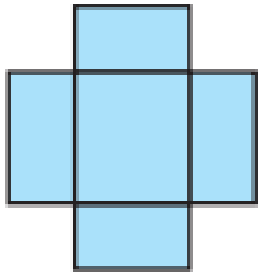
Materials Required: - Pencil, Scale, colour paper, chart paper, scissors etc.

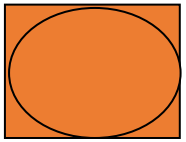
Previous knowledge required: - Knowledge about the parts of circle, area of a circle, Surface area of a cube.

Procedure: - Students are made to discuss about the nature of the task. The problem of real time situation is brought to be represented on paper diagrammatically. Students represent their problem diagrammatically as shown using colour papers.









Every group is provided with the solid. A group of students get the measure the side of the cube, the other group of students measure the length of radius of the curved part. Measured data is placed in the table .Repeated measurements are taken for accuracy.

Surface area of hemisphere $= 2\pi r^2$

Curved Surface area of the solid $= 5a^2 + (a^2 - \pi r^2) + 2\pi r^2$

$= 6a^2 + \pi r^2$

Integration of Art: - Students use their artistic skill in the proper representation of the real time problem. Neatly paste the work on a chart paper.

Students repeat the activity for another repeated measurements and record their observations. A discussion is initiated among the students.

Observation:-

Students after careful study, calculate the Surface Area of the given solid

Students be able to measure the surface area of such solid shapes which are of real time problems. Apply the knowledge to calculate surface area of the solids of different combinations.

CHAPTER : SURFACE AREAS AND VOLUMES

VOLUME OF COMBINATION OF HEMI-SPHERE AND CYLINDER

Activity – 19

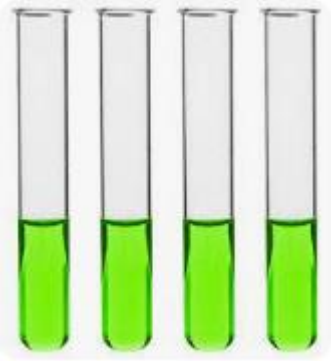
Objective: To calculate the total volume of a solid through an activity.

Materials required: - Pencil, Scale, colour paper, chart paper, cylindrical glass jars

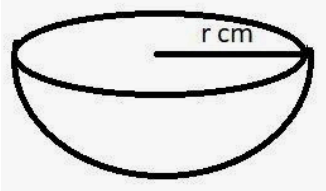
Previous knowledge required: - Knowledge about volume of cylinder, volume of sphere

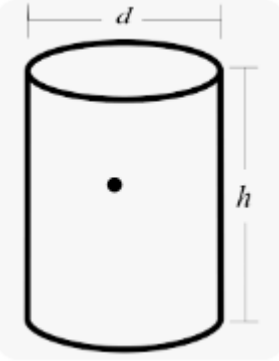
Procedure: - Students are made to discuss about the nature of the task. The problem of real time situation is brought to be represented on paper diagrammatically. Students represent their problem using colour papers.

Students with the cylindrical test



help of thread and scale measure the radius and the height of the tube.





SL. No	Length of thread $2\pi r$	Radius r	Height of tube l	Height of cylinder h = l-r	Volume of hemisphere $\frac{2}{3}\pi r^3$	Volume of cylindrical part $\pi r^2 h$	Volume of Tube= $\frac{2}{3}\pi r^3 + \pi r^2 h$
1							
2							
3							

Every group is provided with the test tube. Students in their team get the measure the radius and the height of the test tube .Measured data is placed in the table .Repeated measurements are taken for accuracy.

Integration of Art: - Students use their artistic skill in the proper representation of the real time problem. Neatly paste the work on a chart paper.

Students repeat the activity for another repeated measurements and record their observations. A discussion is initiated among the students.

Observation:-

Students after careful study, calculate the Volume/Capacity of the Test Tube Application:-

Students be able to measure the volume of such shapes which are of real time problems. Apply the knowledge to calculate volume of solids of different combinations.

CHAPTER: STATISTICS

CONCEPT AREA: CALCULATION OF MEDIAN AND MODE

Activity – 20

Objective of Activity:-

Students be able understand and analyze the collected data and be able to calculate Median and Mode.

Materials required: - Pencil, Scale, colour paper, data sheet etc.

Previous knowledge required: - Knowledge about the Measures of central tendencies. Formulae to find the Measures of central tendencies.

Procedure: - Students are asked to discuss about the nature of the task. The problem of real time situation is brought to be represented on paper diagrammatically. Students represent their problem diagrammatically as shown using colour papers.

Students collect the marks obtained by the students of a class classify in to groups with class intervals. And then calculate the Median and Mode

SL. No	Name of students	Marks obtained out of 100
1		
2		
3		

Students classify the students in to groups on the basis of their score with class intervals

Marks	Tally Marks	No of Students(Frequency) f	Cumulative Frequency. cf
0 - 10			
10 -20			

20 - 30			
30 - 40			
40 - 50			
50 - 60			
60 - 70			
70 - 80			
80 - 90			
90 - 100			
		Total	

Students calculate the median and Mode using

Median of grouped data = $l + \left(\frac{\frac{n}{2} - c.f}{f} \right) \times h$

Mode of grouped $= l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$

Every group is provided with the data set. A group of students get the value of Median the group of students calculate the value of Mode and compare with their pre guessed value.

Measures of central Tendency	Guess before calculation	Calculated value	Difference
Median			
Mode			

Integration of Art: - Students neatly present their table.

Students repeat the activity for another repeated measurements and record their observations. A discussion is initiated among the students.

Observation:-

Students after careful study, calculate the Median and Mode

Application:-

Students be able to measure the Measures of central tendencies.

Apply the knowledge in any other real life situations.

CHAPTER : STATISTICS

CALICULATION OF MEAN (Direct Method)

Activity – 21

Objective of Activity:-

Students be able understand and analyze the collected data and be able to calculate Mean of the data.

Materials required: - Pencil, Scale, colour paper, data sheet etc.

Previous knowledge required: - Knowledge about the Measures of central tendencies. Formulae to find the Measures of central tendencies.

Procedure: - Students are asked to discuss about the nature of the task. The problem of real time situation is brought to be represented on paper diagrammatically. Students represent their problem diagrammatically as shown using colour papers.

Students collect the marks obtained by the students of a class classify in to groups and then calculate the Mean.

SL.	Name of students	Marks obtained

No		out of 100
1		
2		
3		

Students classify the students in to groups on the basis of their score with class intervals

Marks X_i	Tally Marks	No of Students(Frequency) f_i	$X_i \times F_i$
		Total	Total

Students calculate the mean $\bar{x} = \frac{\sum x_i f_i}{\sum f_i}$

Every group is provided with the data set. A group of students get the value of Mean.

Integration of Art: - Students neatly present their table.

Students repeat the activity for another set of data and record their observations. A discussion is initiated among the students.

Observation:-

Students after careful study, calculate the Mean and understand the use of formula.

Application:-

Students be able to measure the Measures of central tendencies.

Apply the knowledge in any other real life situations.

CHAPTER : PROBABILITY

CONCEPT AREA : Probability of tossing a coin

Activity – 22

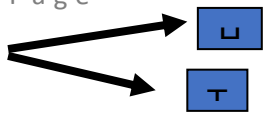
The degree of certainty or uncertainty of events is measured in terms of numbers between 0 and 1.

Galileo, an Italian Mathematician was the first person to attempt at quantitative measurement of probability while dealing with some problems related to theory of dice gambling.
An operation which results in some well-defined outcomes is called an experiment

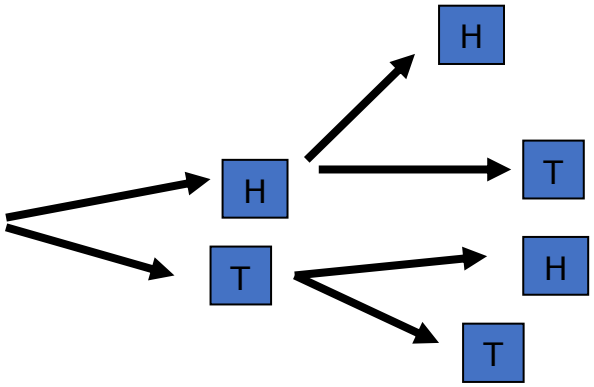
It is an experiment conducted under identical conditions, having more than one outcome, all of whom are known but the result cannot be predicted with certainty in advance.

An experiment is called random experiment if it satisfies the following two conditions:
(i) It has more than one possible outcome.
(ii) It is not possible to predict the outcome in advance.
An experiment whose outcome can be foretold beforehand is not an random experiment.
For example when a stone is thrown upwards, it will sure will fall back and hence is not an random experiment.
A possible result of a random experiment is called its outcome

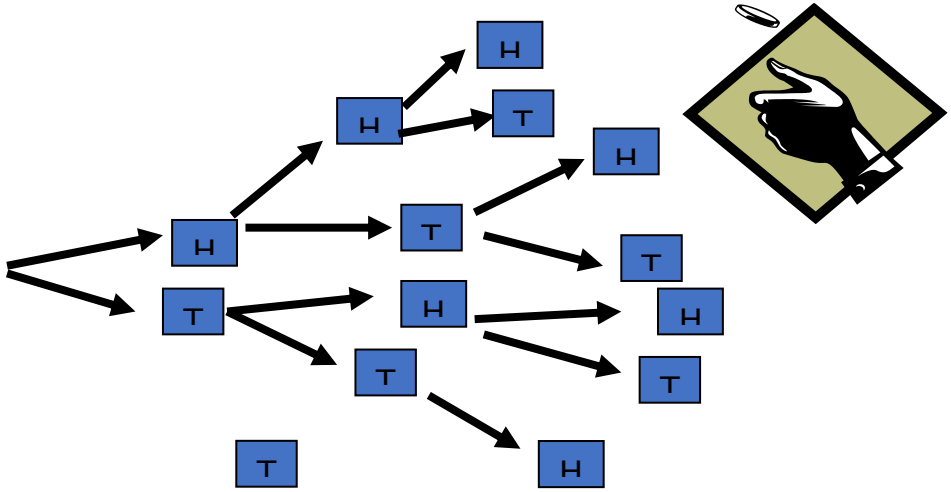
SAMPLE SPACE FOR TOSSING OF ONE COIN



SAMPLE SPACE FOR TOSSING OF TWO COINS



SAMPLE SPACE FOR TOSSING OF THREE COINS

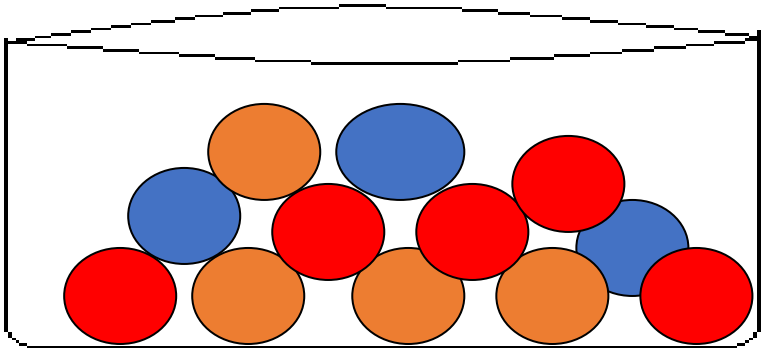


$$P(E) = \left[\frac{\text{Number of outcomes favourable to E}}{\text{Number of all possible outcomes}}\right]$$

1. Probability of an impossible event is zero.
2. Probability of a sure event is one.
3. P (E) + P (not E) = 1

A bag contains 5 red balls , 4 blue balls and 3 green balls
One ball is drawn at random from the bag. Find the probability that the ball drawn is

1. Red 2. Green 3.Blue 4.Not red 5.Either red or blue



6. Either blue or green 7.Neither red nor green
8. Neither blue nor green 9.Red or blue or green 10.White

CHAPTER : PROBABILITY

CONCEPT AREA : Probability and Playing Cards

Activity – 23

Objective of Activity:-

To study and analyze the nature of playing cards and understand the probability related to playing cards.

Materials Required: - Pack of Playing cards, Pencil, Scale, colour paper, data sheet etc.

Previous knowledge required :- Knowledge about the Probability.

Procedure :- Students are asked to discuss about the nature of the task. The problem of real time situation is brought to be experimented. Students perform the activity and record the outcomes. Students collect and analyze the playing cards and record their observations.

Cards	Hearts	Diamond	Spade	Club
Ace	1			
King	1			

Queen	1			
Jack	1			
10	1			
9	1			
8	1			
7	1			
6	1			
5	1			
4	1			
3	1			
2	1			
Total	13			

Probability of Black Cards ------- ----

Probability of Red Cards ----------

Probability of Hearts Cards …….

Probability of Diamond Cards …….

Probability of Spade Cards …….

Probability of Clubs Cards …….

$$P(E) = \left[\frac{\text{Number of outcomes favourable to E}}{\text{Number of all possible outcomes}} \right]$$

Students in their group studies the nature and probability of playing cards

Students show the probability graphically that may give clear perception of probability

CONCLUSION: Students in group studied the nature of playing cards and probability of taking out a card out of well shuffled pack.

SUBJECT: SCIENCE

INDEX

CONTENT DEVELOPMENT TEAM

ACTIVITY 1.

CHEMICAL REACTIONS AND EQUATIONS

ART INTEGRATED PICTOGRAPH ACTIVITY

LEARNING OBJECTIVE

To classify the different types of chemical reactions.

What is required?

Copper sulphate solution, iron nails, lead nitrate crystals, quick lime, water, barium chloride solution, sodium sulphate solution, manganese dioxide, concentrated hydrochloric acid, test tubes, test tube stand, test tube holder and kerosene burner.

How to proceed?

1. Take five test tubes and label them as A, B, C, D and E.

2. In test tube A, add a spatula full of quick lime and then add 1 mL of water. Touch the bottom of the test tube with your fingers. What do you observe? Has any reaction taken place? Write the equation for chemical reaction. What type of reaction is it?

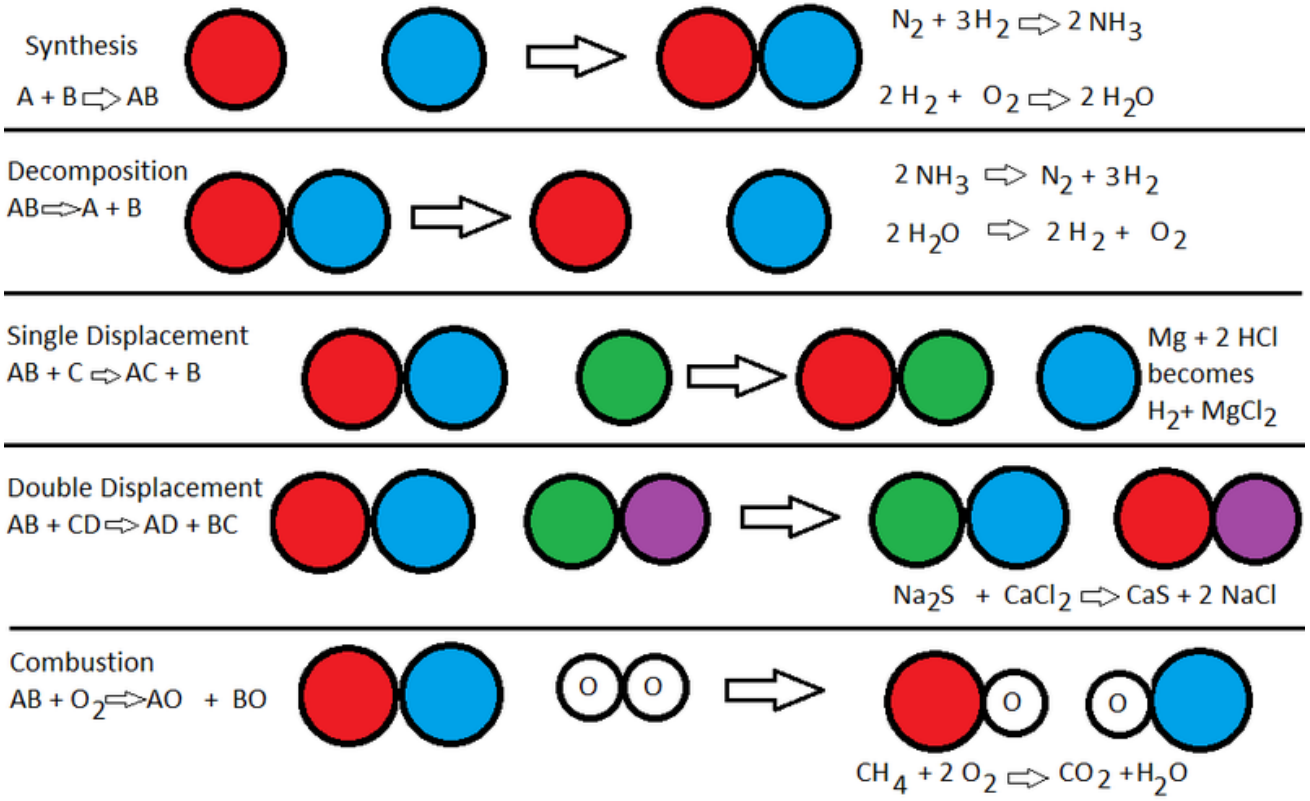
3. In test tube B, take a few crystals of lead nitrate and heat them. Observe the colour of gas evolved and write the chemical equation. Name the type of chemical reaction that has taken place.

4. In test tube C, take a few drops of dilute copper sulphate solution and dip an iron nail into it. After a few minutes, take out the iron nail from the test tube and observe the colour of the deposit on nail. What is the chemical compound deposited on the nail? Write the chemical equation and infer the type of reaction.

5. In test tube D, transfer a small amount of manganese dioxide with the help of spatula and then add a few drops of dilute hydrochloric acid and heat.

Observe the colour of gas evolved. Which gas is it? How do we get this gas? Write the chemical equation for the reaction. Where is the removal of oxygen and of hydrogen taking place? What type of reaction is it?

6. In test tube E, take a few drops of sodium sulphate solution addition and add few drops of barium chloride solution to it. Observe the colour of the precipitate. How is it formed? Write the chemical equation for the reaction taking place.
7. Record your observations carefully and highlight it in the form of a pictograph flowchart.



What we learnt?

1. In test tube A, the type of reaction is combination reaction.
2. In test tube B, the type of reaction is thermal decomposition reaction.
3. In test tube C, displacement reaction takes place.
4. In test tube D, oxidation and reduction take place simultaneously; therefore, this reaction is known as a redox reaction.
5. In test tube E, a double displacement reaction takes place.

ACTIVITY 2.1

ACIDS, BASES AND SALTS

EXPERIMENTAL LEARNING ACTIVITY
LEARNING OBJECTIVE

To illustrate what happens when an electric current is passed through water?

What is required?

Bell jar, rubber cork with two stainless steel electrodes, water, 9 V battery, plug key, connecting wires, glass rod, universal indicator solution, sodium sulphate and Pasteur pipette.

How to proceed?

1. Take about 40 mL water in a 50 mL beaker.

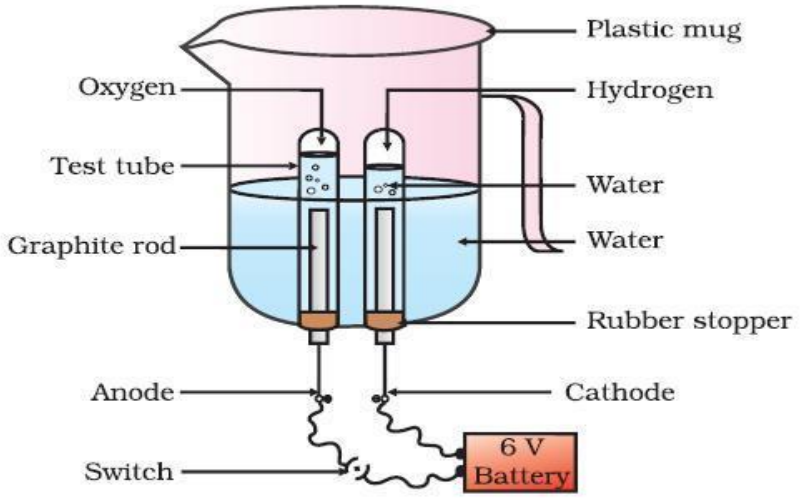
2. Add a few spatula full of sodium sulphate to water and stir well to prepare its concentrated solution.

3. Add universal indicator solution drop-wise till colour of the solution becomes dark green.

4. Take two Pasteur pipettes of 3 mL capacity and cut some portion of their lower ends. Fill the remaining 3 cm of its stem length completely with sodium sulphate solution.

5. Fix the rubber cork with two stainless steel electrodes in the bell jar and clamp it in the inverted position as shown in figure.

6. Fill the bell jar with the remaining coloured solution (green coloured).



7. Lower the two Pasteur pipettes filled with coloured solution over two steel electrodes carefully.

8. Connect a 9 V battery to the two electrodes with connecting wires.

9. Insert a plug key in the circuit and keep the key open.

10. Now, close the key and observe the two electrodes carefully. What do you notice?

11. Do you observe bubbles forming on the two electrodes?

12. Do you notice any colour change in the two Pasteur pipettes? Find out the reason of the colour change.

What we learnt?

When an electric current pass through it, water splits into two gases, hydrogen and oxygen.

Extension: Repeat the activity with distilled water without adding any salt and note down your observations.

ACTIVITY 2.2

ACIDS, BASES AND SALTS

ART INTEGRATED ACTIVITIES

LEARNING OBJECTIVE

To identify the acidic and basic nature of substances using different indicators?

What is required?

Blue litmus paper, red litmus paper, phenolphthalein, methyl orange, dil. HCl, Dil. H_2SO_4, CH_3COOH, NaOH, $Ca(OH)_2$, NH_4OH, lemon juice, coffee powder, test tubes, test tube stand.

How to proceed?

Part A

1. Take four test tubes and label them as A, B, C and D and place them in test tube stand.

2. Put small strips of blue litmus paper, red litmus paper, a few drops of phenolphthalein and a few drop of methyl orange respectively in test tubes A, B, C and D.

3. Add a few drops of dil. HCl to each of these test tubes.

In which of the test tubes does the colour of the indicator change? Record your observations in the table and explain.

Part B

Repeat the above Steps (1-3) using NaOH solution instead of dil. HCl in Step 3.

In which test tube does colour of the indicator change? Explain with reason. Record your observations in the table given below.

Part C

Repeat the above Steps (1-3) with each of the following solutions: dil. H_2SO_4, CH_3COOH, $Ca(OH)_2$, NH_4OH, lemon juice, coffee solution and observe the colour changes with all the four indicators.

Record your observations in the following table with the help of colours or diagrams.

Sample	Change in colour of red litmus paper	Change in colour of blue litmus paper	Colour with phenolphthalein	Colour with methyl orange

Indicator	Colour in acid (pH < 7)	Colour at pH = 7	Colour in base (pH > 7)
Red cabbage water	red, pink	purple	blue, green, yellow
Red onion water	red	violet	green
Turmeric water	yellow	yellow	red
Phenolphthalein	colourless	colourless	pink, red
Bromothymol blue	yellow	green	blue
Red litmus	red	red	blue
Blue litmus	red	blue	blue
Universal indicator	red, orange, yellow	green	Blue, violet, purple

OLFACTORY INDICATORS

	Acid	Base
 Onion	Remains smell	Loses it's smell
 Vanilla Extract	Remains smell	Loses it's smell
 	Remains smell	Loses it's smell

What we learnt?

HCl, H_2SO_4, CH_3COOH, lemon juice is acidic in nature and they turn the colour of blue litmus paper to red.

$NaOH$, NH_4OH, $Ca(OH)_2$ and coffee solution are basic in nature and they turn the colour of red litmus paper to blue.

Acids colour is not changed with phenolphthalein. Bases have pink colour with phenolphthalein.

Acids give pink colour with methyl orange. Bases give yellow colour with methyl orange.

Extension

Prepare some indicator strips using materials available in the kitchen.

ACTIVITY 3

METALS AND NON-METALS

MUSIC INTEGRATED ACTIVITY

LEARNING OBJECTIVE

To construct a sing-song method for the reactivity series of various metals.

What is required?

Samples of various metals and chemicals, test tubes, spatula, distill water.

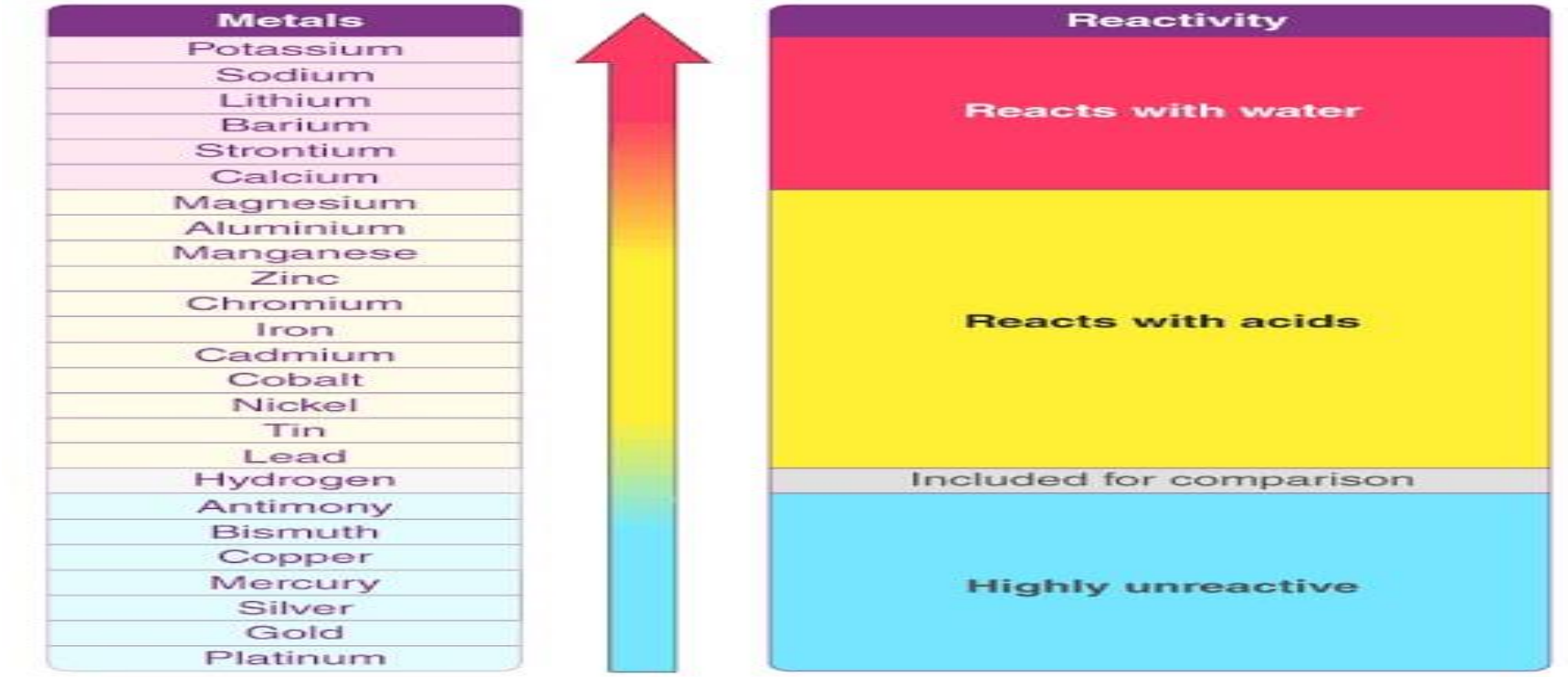
How to proceed?

1. Add equal volumes of dilute hydrochloric acid or dilute sulphuric acid into a series of test tubes then add an equal mass of metal to each test tube. It is important that each metal has the same surface area because this will affect the rate of reaction.

2. Count the number of bubbles produced in a given time. The bubbles are hydrogen gas and can be confirmed using a lit splint, which will produce a 'squeaky pop' when the hydrogen burns.
3. The faster the bubbles are given off, the faster the rate of reaction and the more reactive the metal.
4. Record your observations and create a mnemonic for the reactivity series.

What we learnt?

The reactivity series of metals can be defined as a series of metals, in order of reactivity from highest to lowest.



ACTIVITY 4

CARBON AND ITS COMPOUNDS

EXPERIMENTAL ACTIVITY

LEARNING OBJECTIVE

To analyze how ethanol and ethanoic acid react with each other in the presence of conc. H_2SO_4.

What is required?

Ethanol, ethanoic acid, conc. H_2SO_4, test tube, beaker (10 mL), kerosene burner, tripod stand, aqueous solution of NaHCO3. (If ethanol is not available, take rectified spirit)

How to proceed?

1. Take a few drops of ethanol in a clean test tube. Smell it.
2. Add an equal number of drops of ethanoic acid to the test tube. What is the smell of ethanoic acid?
3. Add one drop of conc. H_2SO_4 to the reaction mixture.
4. Take a beaker (10 mL), fill it about half with water and heat it on a kerosene burner on a tripod stand.
5. Now place the test tube containing the reaction mixture in the beaker and heat it for some time.
6. Take out the test tube and smell the vapours coming out.
7. Is there any difference in the smells of ethanol, ethanoic acid, and the reaction mixture after heating?
8. Pour the reaction mixture into another beaker containing an aqueous solution of $NaHCO_3$.

9. Smell the liberated vapours from the beaker.

10. What is the smell of the vapours?

11. Is it the same as it was coming out before pouring into $NaHCO_3$ solution?

12. Can you tell why this type of smell produced?

13. Why have we poured the reaction mixture in aqueous $NaHCO_3$ solution?

What we learnt?

1. Ethanol reacts with ethanoic acid in the presence of conc. H_2SO_4 to form a fruity smelling compound.

2. The compound formed is known as an ester and the reaction is called as esterification reaction.

3. The equation for the above reaction is:

$C_2H_5OH + CH_3COOOH \longrightarrow CH_3COOC_2H_5 + H_2O$ (in presence of conc. H_2SO_4)

ACTIVITY 4.2

CARBON AND ITS COMPOUNDS

EXPERIMENTAL ACTIVITY

LEARNING OBJECTIVE

To demonstrate how moisture and air affect corrosion.

What is required?

Three test tubes, six iron nails, oil, anhydrous calcium chloride, sand paper and rubber corks.

How to proceed?

1. Take three test tubes and label them as A, B and C.
2. Take iron nails and clean their surface with a sand paper.
3. In test tube A, add some water and put two iron nails and cork it.
4. In test tube B, take some boiled distilled water and add few drops of oil and put two nails into it and cork it.
5. In test tube C, put some anhydrous calcium chloride and place two nails in it. Cork it.
6. Leave the three test tubes without disturbing for one day and then observe.
7. In which test tube the iron nails get rusted?
8. Why do the nails in the other two tubes do not get rusted?

What we learnt?

1. Rusting takes place in test tube A as there is presence of air and water.
2. Rusting does not take place in test tube B as no air is available.
3. Rusting does not take place in test tube C due to absence of water or moisture.

ACTIVITY 5.1

LIFE PROCESSES

ART INTEGRATED CLAY MODELLING

LEARNING OBJECTIVE

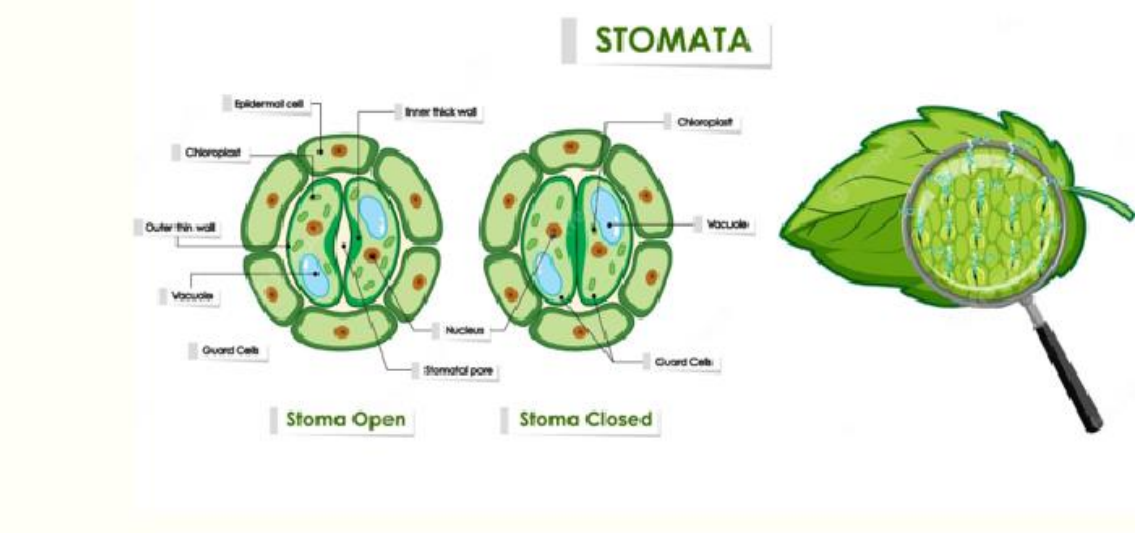
To study the structure of stomata.

What is required?

Slides cover slips, needle, brush, blade, compound microscope, dicot (Bryophyllum, Hibiscus, etc.) and monocot (Lily, Rheo etc.) leaves, safranin, glycerin.

How to proceed?

1. Remove the lower epidermal layer of a leaf by breaking and pulling along gently using needle.
2. Cut a small piece of the peel and place it on a slide in a drop of safranin, wash with water and mount in glycerin.
3. Place a cover slip gently.
4. Observe the slide under low power microscope and count the number of stomata and epidermal cells in the microscopic field.



5. Repeat all the steps of same experiment with leaf peels of other plants.

6. Using clay, model the structure of the stomata based on your observations and understanding in group of 3-4 students

What we learnt?

1. Stomata are in the form of pores/openings surrounded by two guard cells.

2. In monocots, stomata are present on both upper and lower epidermis but in dicots, stomata are present on the lower epidermis only.

Extension

Spread a thin layer of transparent nail polish/quick-fix on the surface of leaves. Allow it to dry. Remove the dried layer gently. Put it on a slide and observe the impression of stomata under the microscope.

Precautions

1. The staining of the peel should be adequate.

2. Cover slip should be placed gently with the help of a needle so as to avoid air bubbles and folding of epidermal peel.

ACTIVITY 5.2

LIFE PROCESSES

SPORTS INTEGRATED ACTIVITY

LEARNING OBJECTIVE

To demonstrate the liberation of carbon dioxide gas during respiration in human beings.

What is required?

Test tube, straw, freshly prepared lime water.

How to proceed?

1. Take a test tube which is half filled with freshly prepared lime water.

2. With the help of a straw, blow air into the lime water.

3. Observe the colour change.

4. Extend the activity by comparing the change in the solution before running and after running.

What we learnt?

The lime water turns milky due to CO_2.

Precaution

Lime water should be prepared a fresh every time.

ACTIVITY 6

CONTROL AND COORDINATION

MUSIC INTEGRATED ACTIVITY

LEARNING OBJECTIVE

To record and analyze the time taken by various students to respond to various stimulus.

What is required?

Students, notebook

How to proceed?

1. Design an experiment by including various types of musical/sound stimulus for each student.

2. Record the amount of time taken by each student to respond to it using a stop watch.

What we learnt?

Stimulus time may vary for each student.

But in a large sample group it tends to remains within a set range.

ACTIVITY 7

HOW DO ORGANISMS REPRODUCE?

PROJECT INTEGRATED ACTIVITY

LEARNING OBJECTIVE

To observe and record various type of reproduction methods in organisms around us.

What is required?

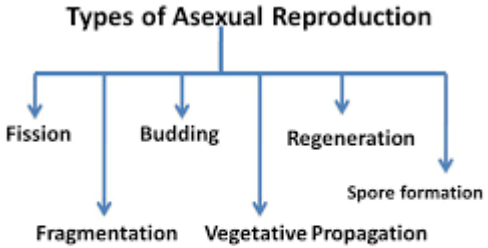
Notebook, illustrative materials

How to proceed?

1. Instruct the students to observe the various organisms around them and inspect the method of reproduction used by them.
2. The observations should be carried out over a period of 4 weeks or more.
3. Record your observations.

What we learnt?

In asexual reproduction in plants, plants are reproduced without the formation of seeds. Following are a few ways in which plants reproduce asexually.



Reproduction occurring through the vegetative parts of a plant such as stems, leaves, buds, and roots is called Vegetative Propagation. These plants take less time to grow and are exact replicas of their parents as they are reproduced from a single parent.

ACTIVITY 8

HEREDITY

PROJECT INTEGRATED ACTIVITY

LEARNING OBJECTIVE

To study the type of ear lobes of sample group in different classes.

What is required?

Notebook, samples

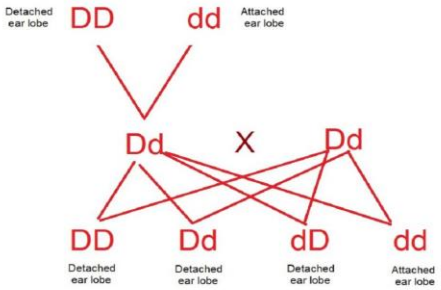
How to proceed?

1. Asks students to observe the ear lobes of friends and compare them with their parents.
2. Record your observations.

What we learnt?

Detached lobe is more frequent in friends with parents with the detached lobe.

If we observe ear lobes of people around us, we find that some have detached ear lobe while others have attached ear lobes. Ear lobe shape is a genetic feature and follows simple Mendelian rule. Here detached lobe is dominant while attached lobe is recessive. So, in the environment, we find detached lobe more frequent. For example, in real life instance, it is around 67% and 33% respectively.



ACTIVITY 9

LIGHT-REFLECTION AND REFRACTION

EXPERIMENTAL LEARNING ACTIVITY

LEARNING OBJECTIVE

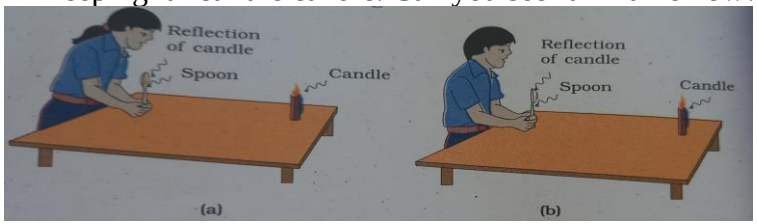
To experiment and observe the image formation by Concave and Convex reflecting surfaces.

What is required?

A large shining spoon and a candle

How to proceed?

1. Hold the spoon near a candle flame (not bigger than 1 cm) with its depressed side (i.e., concave side) towards the flame. Are you able to see image of full flame in the depressed surface of the spoon?
2. Move the spoon slowly away from the candle flame and see how does the image change?
3. Turn the spoon so that its bulged side is towards the candle. See the image in the bulged surface (i.e., convex surface) of the spoon, by keeping it near the candle. Can you see full flame now? How is this image different from the image seen in concave side?



4. Now move the spoon slowly away from the flame and observe how does the image change?

What we learnt?

1. When an object is placed very near to a concave reflecting surface, it's erect and magnified image is seen in it. As the object moves away a stage comes when the image formed by the reflecting surface becomes inverted.

2. When an object is placed very near to a convex reflecting surface, its erect and diminished image is seen in it. As the object moves away from the mirror, the image formed in it remain erect but its size decreases gradually.

Extension

Repeat this activity by using concave and convex mirror from the kit.

ACTIVITY 10

THE HUMAN EYE AND THE COLOURFUL WORLD

EXPERIMENTAL ACTIVITIES

LEARNING OBJECTIVE

To study the refraction of light through a triangular glass prism filled with various substances.

What is required?

Sheet of white paper, drawing board, drawing pins and glass prism.

How to proceed?

1. Fix a sheet of white paper on a drawing board using drawing pins.

2. Place a glass prism on it in such a way that it rests on its triangular base. Trace the outline of the prism using a pencil.

3. Draw a straight line PE inclined to one of the refracting surfaces, say AB, of the prism.

4. Fix two pins, say at points P and Q, on the line PE as shown in figure.

5. Look for the images of the pins, fixed at P and Q, through the other face AC.

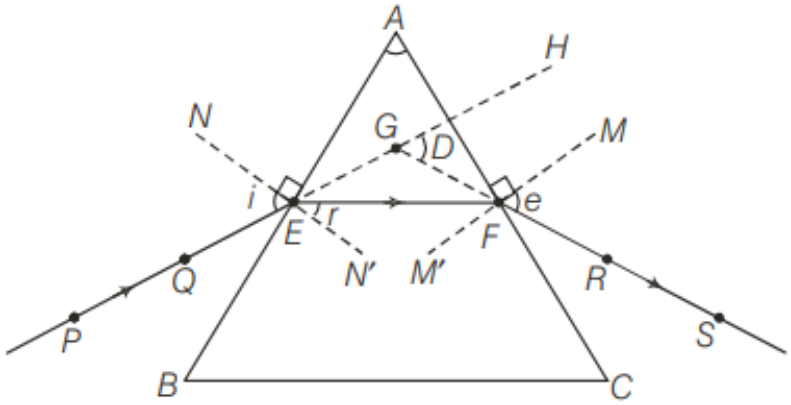
6. Fix two more pins, at points R and S, such that the pins at R and S and the images of the pins at P and Q lie on the same straight line.

7. Remove the pins and the glass prism.

8. The line PE meets the boundary of the prism at point E (see figure). Similarly, join and produce the points R and S. Let these lines meet the boundary of the prism at E and F, respectively. Join E and F.

9. Draw perpendiculars to the refracting surfaces AB and AC of the prism at points E and F, respectively.

10. Mark the angle of incidence (∠i), the angle of refraction (∠r) and the angle of emergence (∠e) as shown in figure. Where, PE = incident ray EF = refracted ray FS = emergent ray ∠A = angle of prism ∠i = angle of incidence ∠r = angle of refraction ∠e = angle of emergence ∠D = angle of deviation.



What we learnt?

The peculiar shape of the prism makes the emergent ray bend at an angle to the direction of the incident ray.

Different transparent substances affect the bending of light up to certain extent.

ACTIVITY 11

ELECTRICITY

PROJECT AND EXPERIMENTAL ACTIVITIES

LEARNING OBJECTIVE

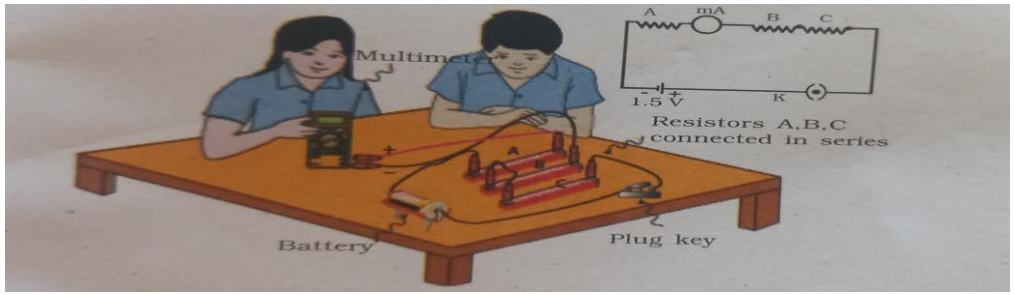
To illustrate if the current passing through different points are same in an electric circuit consisting of different resistors connected in series.

What is required?

A dry cell of 1.5 V and a cell holder (or eliminator set at 1.5 V), multimeter (used as an ammeter), a plug key and three resistors of values 10 ohm, 20 ohm and 30 ohm.

How to proceed?

1. Arrange an electrical circuit as shown in figure.



2. Note the reading of the ammeter.

3. Shift the position of the ammeter to the point B as shown in the figure.

4. Again note the ammeter reading. Is the ammeter reading the same or different?

5. Repeat the activity by shifting the position of the ammeter to the position C in the circuit. Is the ammeter reading the same or different?

6. What do you conclude from your observations?

7. Experiment the same with different types of circuit.

What have we learnt?

Since the ammeter reading remains the same whether it is connected in the circuit at position A or B or C, the current flowing through different points in a series circuit is the same.

Extension

Repeat the activity further by inserting more number of circuit elements and connecting the ammeter at different possible points in the circuit to confirm the above conclusion.

ACTIVITY 12

MAGNETIC EFFECTS OF ELECTRIC CURRENT

EXPERIMENTAL ACTIVITY

LEARNING OBJECTIVE

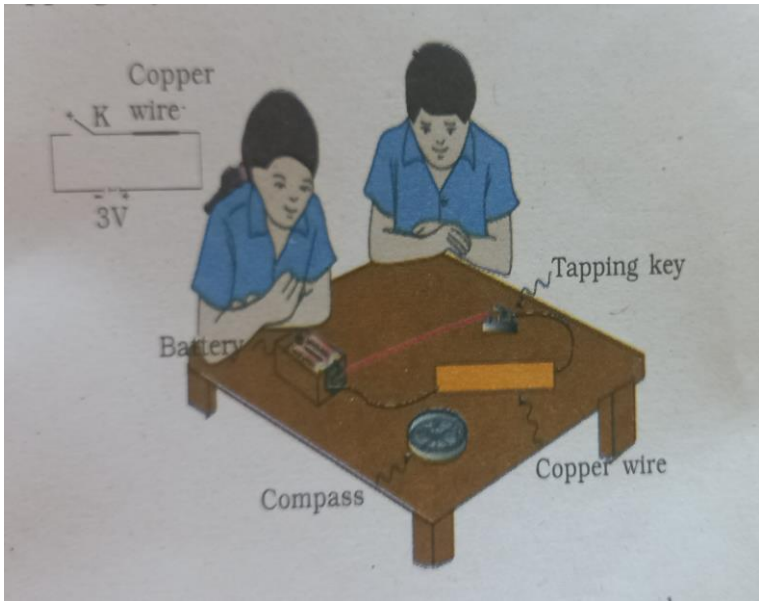
To illustrate if a current carrying conductor produce magnetic field.

What is required?

Two dry cells of 1.5 V each and a cell holder or eliminator set at 3V), a tapping key, a thick copper wire in coil shape (preferably SWG-16) of about 20 cm length, a magnetic compass and two connecting wires

How to proceed?

1. Using connecting wires connect the thick copper wire in coil shape with cells through a tapping key as shown in the figure.



2. Place a magnetic compass under the thick copper wire. Orient the wire parallel to compass needle. Observe the deflection of the needle of the compass on pressing the tapping key for a moment.

3. Reverse the direction of current passing through the copper wire by reversing cell connections. Observe the effect on the needle of the compass. Is the direction of deflection the same as before?

4. Open the tapping key and the current stops. Do you observe any deflection of the compass needle?

What we learnt?

1. As the deflection of compass needle is caused by a magnetic field, a current carrying conductor produces magnetic field around it. As direction of deflection in the compass needle is reversed on reversing the direction of current through it, the direction of the magnetic field is reversed on reversing the direction of current.

Extension

Repeat the activity by keeping the compass above the thick copper wire.

ACTIVITY 13

OUR ENVIRONMENT

PROJECT AND EXPERIMENTAL ACTIVITY

LEARNING OBJECTIVE

To design your own ecosystem.

What is required?

Potted plants, stones, samples of various kind of soil, notebook, Soil testing kit.

How to proceed?

1. Instruct the students to observe the various plants and organisms around them and inspect the various modes of life used by them.
2. The observations should be carried out over a period of 4 weeks or more.
3. Record your observations and construct models of the different food chains existing in your surroundings.
4. Test the various samples of soil using the testing kit.

What we learnt?

An ecosystem is a structural and functional unit of ecology where the living organisms interact with each other and the surrounding environment. In other words, an ecosystem is a chain of interactions between organisms and their environment.

SUBJECT: SOCIAL SCIENCE

CONTENT

HISTORY **CHAPTER -1 THE RISE OF NATIONALISM IN EUROPE**

TOPIC	THE MAKING OF GERMANY AND ITALY
LEARNING OBJECTIVES	• Students will be able to Examine the ways by which the idea of nationalism emerged and led to the formation of nation states • Students will analyse the role played by Otto von Bismarck and Giuseppe Mazzini. • Develop the patriotic feeling among the students. • Develop scientific outlook among the students regarding historical incidents
ACTIVITY DESCRIPTION	 **ACTIVITY-1** • Germania became the allegory of which nation? • Discuss the importance of language and popular traditions in the creation of national identity • Identify the attributes of Germania and interpret the symbolic meaning of the painting. • Artists Used Female Figure to Portray a Nation /Personification of a Nation give example from India and France **ACTIVITY-2** **Collect pictures of the important personalities** - Otto von Bismarck ,Giuseppe Mazzini,Napoleon and explain their contributions towards Nationalism in Europe.
INSTRUCTIONS	• Students will be divided into four groups and will have a debate on how language and tradition create national identity. • Map marking on European countries that fought for unification their countries.
LEARNING OUTCOMES	• Students will understand the relationship and bring out the difference between European nationalism and anticolonial nationalisms. • Recognizes the role of Otto Van Bismarck in the unification of Germany. • Observes the map of Italy and understands the various developments responsible for unification of Italy. • Interprets the visuals/images pertaining to the allegory of France and Germany • Differentiates the meaning of liberalism as seen in the Political and economic Sphere and as seen by the new middle classes.
METHODOLOGY	**ACTIVITY-1** - Group activity **ACTIVITY-2** - Individual activity

THE RISE OF NATIONALISM IN EUROPE

CHAPTER - 2 NATIONALISM IN INDIA

TOPIC	THE SENSE OF COLLECTING BELONGING
LEARNING OBJECTIVES	❖ To encourage the students to know about , fiction, folklore and songs, popular prints and symbols, all played a part in the making of nationalism ❖ Sense of collective belonging came partly through the experience of united struggles. ❖ To know about variety of cultural processes through which nationalism captured people's imagination ❖ To know about recollecting common bonds and shared beliefs which gave rise to Collective Belonging
ACTIVITY DESCRIPTION	ACTIVITY-1 ❖ Draw and paint Swadeshi , a tricolour flag (red, green and yellow) and Swaraj flag on canvas cloth ACTIVITY-2 ❖ Enacting role play on patriotism of any Satyagraha movement.
INSTRUCTIONS	❖ Students will be divided in to different group and asked to do painting. ❖ Class will be divided into four groups and perform role play
LEARNING OUTCOMES	❖ Students will know that the Ideas of nationalism also developed through a movement to revive Indian folklore ❖ Students will know about the culture and tradition of India ❖ Students will understand the effort taken by our national leaders.
METHODOLOGY	ACTIVITY-1 – Individual activity/Group Activity ACTIVITY-2 - Group activity

LEARNING OBJECTIVE	• Enable the learners to identify and comprehend the forms in which nationalism developed along with the formation of nation states in Europe in the post-1830 period • Understand the way the idea of nationalism emerged and led to the formation of nation states in Europe and elsewhere. • Students will understand about Conservative regimes were autocratic. They did not tolerate criticism and dissent, and sought to curb activities that questioned the legitimacy of autocratic governments.
ACTIVITY DISCRIPTION	 ACTIVITY-1 What is the caricaturist trying to depict? ACTIVITY-2 Worksheets will be prepared on an ideas of liberals, conservatives, new aristocratic and middle classes on revolutions.
INSTRUCTIONS	• Students will be divided in four groups based on the topic; individual questions will be put up on the children. • Dividing the children into groups assign them the questions based on pictures given in the lesson.
LEARNING OUTCOME	• Recognizes the inherent features of the four prints of 'Democratic and Social Republics' • Identifies the role of French Revolution in spreading the ideas of equality and liberty in Europe. • Acquires the skill of locating countries of Europe after the • Congress of Vienna, 1815
METHODOLOGY	ACTIVITY-1 Group activity ACTIVITY-2Individual activity

NATIONALISM IN INDIA

TOPIC	SATYAGRAHA MOVEMENTS
LEARNING OBJECTIVE	• Students to know about Colonial domination and Indian Resistance. • Focus on the First World War and its impact • Discussing the idea of Satyagraha analysing the impact of Rowlett Act and Jallianwallan Bagh Incident • Enumerate Women's role in India. • Students to understand the various stages of national movement.
ACTIVITY DISCRIPTION	 ACTIVITY-1 Demonstration of Dandi March within the school premises. ACTIVITY-2 Map marking on important Indian National Congress sessions and places of Satyagraha movements ACTIVITY -3 Gandhi ji in Satyagraha movements –Role Play
INSTRUCTIONS	❖ Students will be divided in a group and will have a role play on Dandi March or Non Cooperation Movement ❖ Individual activity can be given as map marking
LEARNING OUTCOME	❖ Student will be able to understand the value of independence ❖ Realize the harmful effects of division and disintegration ❖ Develop a sense of patriotism, cooperation and belongingness.
METHODOLOGY	ACTIVITY-1 Group Activity ACTIVITY-2 Individual Activity ACTIVITY-3 Individual Activity

HISTORY CHAPTER- 3 MAKING OF GLOBAL WORLD

TOPIC	SILK ROUTE LINK THE WORLD.
LEARNING OBJECTIVES	• The students will know about silk routes are a good example of vibrant Trade and cultural exchange always went hand in hand. • Trade and cultural exchange always went hand in hand
ACTIVITY DESCRIPTION	ACTIVITY -1 - Map showing silk route ACTIVITY -2 Group discussion-Traders and travellers introduced new crops to the land
INSTRUCTIONS	• Students will be divided into four groups • Map marking
LEARNING OUTCOMES	• Students will learn the importance of silk route , modern trade and cultural interactions . • Students will understand that many of our common foods such as potatoes, groundnuts, maize were not known to our ancestors until about five centuries ago. These foods were only introduced in Europe and Asia after Christopher Columbus accidentally discovered the vast continent that would later become known as the Americas.
METHODOLOGY	Activity-1 Individual activity Activity-2 Group activity

HISTORY CHAPTER- 3 MAKING OF GLOBAL WORLD

TOPIC	INDIAN TRADE, COLONIALISM AND THE GLOBAL SYSTEM.
LEARNING OBJECTIVES	• Appreciate the ideas promoting Pan Indian belongingness • Analyse the implication of globalization for local economies
ACTIVITY DESCRIPTION	• Interdisciplinary project • Debate
INSTRUCTIONS	• Students will be divided into group for a debate Colonialism and Global system • Individual or Group activity
LEARNING OUTCOMES	• Students will learn to do interdisciplinary project on the making of the global world could involve exploring the historical, economic, political, and cultural factors that have contributed to the globalization of trade, travel, and communication.
METHODOLOGY	• Activity-1 Individual activity • Activity-2 Group activity

CHAPTER - 4 **THE AGE OF INDUSTRIALIZATION**

TOPIC	MARKET FOR GOODS
LEARNING OBJECTIVES	• Students to understand the role of advertisements in shaping the minds of people and create new needs. • To gain knowledge the different types of advertisements from the very beginning of the industrial age, have played a part in expanding the markets for products • To enable the students to analyse the impact of Industrialisation in the colonies
ACTIVITY DESCRIPTION	 Activity -1 Advertisement. - The methods used by producers to expand their markets in the 19th century. collect/draw pictures of early industrialization advertisements Activity -2 Debate on the impact of Industrialisation in the colonies with specific focus on India
INSTRUCTIONS	• Group activity Consumers are created through advertisement. The students will be divided into groups -collect/draw pictures of early industrialization advertisements
LEARNING OUTCOMES	The students will be able to analyse the impact of Industrialisation in the colonies
METHODOLOGY	Activity-1 Individual activity Activity-2 Group activity

CHAPTER -5 PRINT CULTURE AND THE MODERN WORLD

TOPIC	THE FIRST PRINTED BOOKS
LEARNING OBJECTIVES	• Students will know about the earliest kind of print technology was developed in China, Japan and Korea • This new reading culture was accompanied by a new technology • Paper made possible the production of manuscripts, carefully written by scribes.
ACTIVITY DESCRIPTION	• Making a scrap book finding out more about the changes in print technology in the last 100 years, write about the changes, explaining why they have taken place. • Picture comprehension
INSTRUCTIONS	• Students will be asked to do scrap book collecting information on evolution printing press • Students will be given individual activity on picture comprehension
LEARNING OUTCOMES	• Students will learn about the origin of print culture • Contribution of Gutenberg in bringing out print • The first book Bible printed by him
METHODOLOGY	Activity-1Group activity Activity-2 Individual activity

Print Culture and the Modern World

CHAPTER/TOPIC	**THE PRINT REVOLUTION AND ITS IMPACT**
LEARNING OBJECTIVES	• Students will know about the books created a new culture of reading • People lived in a world of oral culture. They heard sacred texts read out, ballads recited, and folk tales narrated. Knowledge was transferred orally
ACTIVITY DESCRIPTION	 1. what do you learn from the above picture shown 2. You are a bookseller advertising the availability of new cheap printed books. Design a poster for your shop window
INSTRUCTIONS	• Students will be divided in different groups and have to do picture based questions • Individual activity- to show the creativity of the children
LEARNING OUTCOMES	• Students will understand that by the end of the nineteenth century, a new visual culture was taking shape. With the setting up of an increasing number of printing presses. • social reforms and novels had already created a great interest in women's lives and emotions,
METHODOLOGY	Activity-1Group activity Activity-2 Individual activity

CLASS: X GEOGRAPHY CHAPTER - 1 RESOURCES AND DEVELOPMENT

CHAPTER	**RESOURCES AND DEVELOPMENT**
LEARNING OBJECTIVES	❖ To understand the value of resources and the need for their judicious utilization and conservation. ❖ To identify the causes of land degradation and methods of conservation.
ACTIVITY DESCRIPTION	**Activity1)** Group Discussion **Activity 2)** Power point Presentation **Activity 3)** Poster making
INSTRUCTIONS	**Activity 1)**Group Discussion - Causes of land degradation and methods of land conservation. • The students will be divided into groups and shall be given one article/newspaper cut out/picture to each related to the topic - causes of land degradation. • Five minutes- time for group discussion • Two to Three minutes - One member will be presenting the points in front of the whole class. • Two minutes for open discussion /left out points by other students and finally summarized by the teacher **Activity 2)** Power point Presentation-Methods of land conservation/Resource conservation. 10 - !5 slides related to the topic to be prepared by the students and presented in the class room.(one topic each- Methods of land conservation/ Resource conservation) **Activity 3)** Poster making - ❖ Conserve Resources ❖ Say No to Plastics
LEARNING OUTCOMES	Learners will be able to :- ➢ Realize the importance of conservation of the resources. ➢ Sensitize measures to check wastage of resources& preserve for future. ➢ Believe in conservation of resources
METHODOLOGY	Activity 1) Group Activity Activity 2) Pair/Individual Activity Activity 3) Individual Activity

GEOGRAPHY CHAPTER – 2 FOREST AND WILDLIFE RESOURCES

CHAPTER/TOPIC	**FOREST AND WILDLIFE RESOURCES**
LEARNING OBJECTIVES	• To understand the importance of forests and wildlife in maintaining the ecological balance of our environment. • To identify the various threats that forests and wildlife face in the modern world. • To encourage students to become active participants in conservation efforts in their local community.
ACTIVITY DESCRIPTION	Activity 1) Field Trip Activity 2) Discussion Method Activity 3) Seminar Method Activity 4) Afforestation
INSTRUCTIONS	**Activity 1)** Field Trip -The first activity we plan to do with our students is a forest exploration The students to be taken on a study tour to the local forest/National Park/Wildlife Sanctuary teaching them about the different plants and animals. **Activity 2)**Discussion Method - • the importance of forests and wildlife • various threats that forests and wildlife face in the modern world. **Activity 3)**Seminar Method using Power point Presentation – Gifted students can be given an opportunity to exhibit their talents (one topic each) • The various threats faced by Forests and wildlife resources in the modern world. • Government's effort in conservation of forest and wildlife. • Communities role in Conservation of Forest and Wildlife **Activity 4)** Afforestation- Planting Saplings in the school premises or in their locality
LEARNING OUTCOMES	Learners will be able to :- ➢ Realize the importance of conservation of the forest resources. ➢ Students will also learn about how people can help conserve forests and wildlife.
METHODOLOGY	**Activity 1)** Whole Class **Activity 2)**Group Activity **Activity 3)** Pair/Individual Activity **Activity 4)** Group Activity

GEOGRAPHY CHAPTER -3 WATER RESOURCES

CHAPTER/TOPIC	WATER SCARCITY
LEARNING OBJECTIVES	➢ Understand the problem of water scarcity. ➢ Identify and locate rivers and dams. ➢ Enhance critical thinking skills by exploring various responses to conserve water. ➢ To understand sources, distribution, multi-purpose projects on water resources.
ACTIVITY DESCRIPTION	• The activity will involve students participating in a role-playing simulating a community response to water scarcity. • The class will be divided into groups, with each group assigned specific roles representing different stakeholders in the community. • Day to day experience of water scarcity in urban and rural areas and their responses may be used as a base to enact. • Being a renewable resource, there is scarcity of water in many parts of India-reasons • Climate change- variations in annual rainfall in terms of region and season. • Increased human consumption- exploitation and excessive usage of water. • Use and wastage of water-Unequal access to water amongst different social groups • Role of government- (1)-National River Conservation Programme (NRCP) (2) National Green Tribunal. (3) Jal Jeevan Mission. (4) National Lake Conservation Programme (NLCP)
INSTRUCTIONS	• Each group will be given time to discuss their roles and responsibilities. • The role-playing scenario will unfold in real-time, with students enacting their roles and interacting with other groups to respond to the situations. • Briefing of groups, discussions on their roles. • Recapitulating the importance of water as a resource and to conserve.
LEARNING OUTCOMES	• Support the importance of water. • Rationalize the usage of water in terms of quality and quantity. • Become aware of the conservation and management of water resources. • Correlate water scarcity with availability of consumable water. • Enhances the importance of readiness and community preparedness in managing any calamity.
METHODOLOGY	Group Activity

WATER RESOURCES

CHAPTER/TOPIC	**WATER RESOURCES** Conservation of water- How to save water in School
LEARNING OBJECTIVES	• To understand the importance of water as a resource. • To enhance the operational and maintenance of water supply systems to provide sustainable, equitable, and adequate water. • To explore various method to conserve water resources. • To inculcate students to save water resources and to play an effective participant along with the community.
ACTIVITY DESCRIPTION	• The activity will involve students participating in Discussions to save water in school premises. • The students will draw sign boards in water usage areas. • Stay informed about the latest requirements for water conservation.-school garden methods of watering the plants.
INSTRUCTIONS	• Group Discussion - Methods of water conservation. • Task for individual/pair for collection of methods used to save water in the school campus. • Students to draw and put signs boards near the wash basins to remind students to turn off taps as soon as they wash their hands. • Students to detect any leaks in taps at school premise and to inform -so that wastage of water will get reduce. • Methods to follow discussions -Avoid flushing the toilet unnecessarily-. Students to present their information. • Encourage students to use refillable water bottle and educate them to pour leftover water on to the garden • Dispose of tissues, and other similar waste in the dustbins not in the toilet. • Take part in school gardening activity -to know the requirements of water for plants. • To collect information of the conservation methods used in school premises; -the rainwater harvesting, drip irrigation, pebble mulching techniques used in the campus. Finally teacher to discuss and appreciate, motivate children to practice conservation of resources.
LEARNING OUTCOMES	• Realize the importance of conservation of water resources. • Awareness and conservation and management of water resources with community. • Creative skills to explore conservation methods and to follow up.
METHODOLOGY	Pair/Individual Activity

GEOGRAPHY CHAPTER -4 AGRICULTURE

TOPIC	GARDENING IN SCHOOL CAMPUS
LEARNING OBJECTIVES	To Protect and enhance the environment and natural resources. • Make the best use of the resources available. • To know and understand the different plants, trees in the school premises. • Produce sufficient high-quality and safe food.
ACTIVITY DESCRIPTION	• The activity will involve students in growing vegetables and variety of flowering and nonflowering plants in school campus. • The students to do different practices of farming. • The activity will involve students participating in growing vegetables and variety of flowering and nonflowering plants in school campus. • The students to do different practices of farming.
INSTRUCTIONS	• Students practice/learn the activity individual and with group. • Students to choose the hands on work -like the area to practice farming in school premises. /including pots in classroom, tilling the soil, watering the plants, weeding, put organic manures, harvesting. • Students sow vegetable seeds and monitor the growth of the plants. • Classrooms can be potted with plants made by students using clay, coconut shells, unused water bottles, shoes-pots can be designs, coloured. • Different methods of irrigation –sprinkle irrigation, drip irrigation used in the can be observed by the students in the premises. • The teacher to integrate with gardener of the school suggest the seeds to be sown, plants to be grown in potted and in landscape for green school campus.
LEARNING OUTCOMES	• Students will be able to recognize and examine the relationships between inputs and outputs in their agricultural field to make effective decisions. • Students will understand how to use organic materials. • Students will enhance living with nature –observe birds, insects. • Empathy and perspective taking as students consider the experiences and challenges faced by farmers.
METHODOLOGY	Individual /group activity.

AGRICULTURE

CHAPTER/TOPIC	FOOD GRAINS
LEARNING OBJECTIVES	• To know the different food grains. • To understand the seasons of crops are different. • To learn the nutritional values of grains and their importance.
ACTIVITY DESCRIPTION	• The activity will involve students to bring different food grains in less quantity and display in the classroom. • The students to do cooking without fire recipes.
INSTRUCTIONS	• Students to display the food grains in a biodegradable container-like made with leaves(badam leaf, banana leaf lotus leaf) Students can do the containers from the leaves of the trees /plants in the school campus. • Each student to be asked to name the food grains.-find out whether the students are able to find .maximum identified student can be appreciated. • Prepare fire less cooking with the grains and other ingredients. • Sharing the recipes prepared and process of preparing. • Finally the teacher gist out and add the nutritional values of the food grains.
LEARNING OUTCOMES	• Students will know the different food grains and their names. • Students will have an experience of cooking.
METHODOLOGY	Individual /group activity.

GEOGRAPHY CHAPTER -5 MANUFACTURING INDUSTRY

CHAPTER/TOPIC	MANUFACTURING INDUSTRY
LEARNING OBJECTIVES	• To understand the importance of manufacturing industries in the economy, and analyze the impact of these industries on the environment. • Make them learn about the measures taken to mitigate environmental damage.
ACTIVITY DESCRIPTION	Group discussion Conduct a group discussion in the class.
INSTRUCTIONS	• whole class to be divided into groups • Assign each group a type of industry. • Each group discusses the importance, distribution and environmental impact of their assigned industry
LEARNING OUTCOMES	• Understand the importance of manufacturing industries in the economy. • Understand the impact on the environment.
METHODOLOGY	Group activity

GEOGRAPHY CHAPTER -6

CHAPTER/TOPIC	**MINERAL AND ENERGY RESOURCES**
LEARNIN OBJECTIVES	• To understand the importance of minerals and energy resources. • To distinguish between different types of minerals and their distribution. • To comprehend the significance of conservation of minerals. • To explore the various sources of energy and their importance for development.
ACTIVITY DESCRIPTION	Group discussion Conduct a group discussion in the class.
INSTRUCTIONS	• Divide the class into small groups and assigned each group a mineral. Each group will research the uses, global distribution, and mining impacts of their mineral and present their findings in a creative way.
LEARNING OUTCOMES	• Understand the significance of conservation of minerals. • Understand the challenges of transitioning to renewable energy sources and the role of individuals in conserving energy.
METHODOLOGY	Individual

GEOGRAPHY CHAPTER -7

CHAPTER/TOPIC	**LIFELINES OF NATIONAL ECONOMY** Inter disciplinary project with chapter 3 of History: The making of a Global world and chapter 4 of Economics: Globalization and the Indian Economy **Refer Annexure IV** CBSE SOCIAL SCIENCE SYLLABUS 2023-24 (Code No. 087) **Class X – Only map pointing to be evaluated in the Board Examination** **Map work Page 37 &38** CBSE SOCIAL SCIENCE SYLLABUS 2023-24 (Code No. 087) **Locating and Labelling:** **a. Major sea ports** : Kandla• Mumbai• Marmagao• New Mangalore• Kochi• Tuticorin• Chennai• Vishakhapatnam• Paradip• Haldia• **b. International Airports**: Amritsar (Raja Sansi - Sri Guru Ram Dass• jee) Delhi (Indira Gandhi)• Mumbai (Chhatrapati Shivaji)• Chennai (Meenam Bakkam)• Kolkata (Netaji Subhash Chandra Bose)• Hyderabad (Rajiv Gandhi)•

CLASS: X DEMOCRATIC POLITICS –II CHAPTER -1

CHAPTER	POWER SHARING
LEARNING OBJECTIVES	To Understand how Power sharing tries to resolve the conflicts between different social group
ACTIVITY DESCRIPTION	Role-Play: Ask students to choose 2 situations where one group shares power, while the other does not.
INSTRUCTIONS	Divide students into 3 groups. 1 Legislative 2. Executive 3 Judiciary
LEARNING OUTCOMES	• Students will be able to bring out a situation where each one does their role to prove power sharing avoids conflicts which is the very purpose of Power Sharing • Students will be to imagine situations construct dialogues to enact their roles
METHODOLOGY	Group

DEMOCRATIC POLITICS –II CHAPTER -2

CHAPTER/TOPIC	FEDERALISM
LEARNING OBJECTIVES	Students learn the dual objectives 1. To safeguard and to promote the unity of the country. 2. At the same time accommodating regional diversity.
ACTIVITY DESCRIPTION	Conducting a Gram Sabha meeting.
INSTRUCTIONS	Imagine you are in a Gram Sabha meeting. Elect a Sarpanch and Discuss the issues in the village.
LEARNING OUTCOMES	Students will be able to Appreciate, respect the power sharing process in India and Know about the decentralization of power in India
METHODOLOGY	Group

DEMOCRATIC POLITICS –II CHAPTER -3

CHAPTER/TOPIC	GENDER, RELIGION AND CASTE
LEARNING OBJECTIVES	Understand about the importance of movements took place against discrimination on the grounds of gender, religion and caste
ACTIVITY DESCRIPTION	Art integrated Activity Make Art Gallery of women achievers in Para Olympics Time :2 periods
INSTRUCTIONS	i. Instruct the children to find information about the sportswomen who achieved success in Para Olympics
LEARNING OUTCOMES	i. understand the challenges faced by people , also know how people face challenges to meet success ii. Gain motivation and self confidence
METHODOLOGY	Individual

DEMOCRATIC POLITICS –II CHAPTER -4

CHAPTER/TOPIC	POLITICAL PARTIES
LEARNING OBJECTIVES	i. Gain knowledge about different party system and the role of political parties in the government functioning. ii. Understand about multiparty system and its need for the present political system.
ACTIVITY DESCRIPTION	Experiential learning Conduct Mock Election for the post of class monitor and vice monitor including election procedures like nomination, electoral roll, election campaign and polling
INSTRUCTIONS	i. whole class to be divided into groups ii. instruct about election procedure iii. facilitate in the activity
LEARNING OUTCOMES	Understand the value of voting and voting rights Understand the values of democracy and democratic election
METHODOLOGY	Group activity

DEMOCRATIC POLITICS –II CHAPTER -5

CHAPTER/TOPIC	OUTCOMES OF DEMOCRACY
LEARNING OBJECTIVES	• Identify the need to accommodate social and cultural diversity in a democracy. • Understand how a democracy promotes acceptance of diversity. • Appreciate that democracy forms a legal basis for equality and dignity of all citizens.
ACTIVITY	Group discussion on outcomes of democracy
ACTIVITY DESCRIPTION	• The activity will involve three groups of students. Groups will represent different form of government's wide democratic government, autocratic government and monarchical government. • They will collect the data about condition of people and of domains such as policy making, execution and development etc. • These groups then will discuss and debate about effects of different form of governments on these domains. • They will do a comparative study of the holistic outcome of different governing ways.
INSTRUCTIONS	After dividing students in groups ask them to learn about following domains about respective form of government: ➢ Accountability of government ➢ Responsiveness and legitimacy ➢ Economic growth and development ➢ Improvements in the living standards ➢ Effect on inclusiveness ➢ Freedom and liberty of expression ➢ Dignity of the citizens
LEARNING OUTCOMES	➢ Pupil will be able to analyze effects of different governing styles. ➢ Understand how certain way of governing can be better in some aspects than another. ➢ Know which form of government will be more accountable to it citizens. ➢ Appreciate how democratic form of government respects differences. ➢ Understand how the status living standards and dignity of the citizen differs in different form of governments.
METHODOLOGY	Group discussion and debate.

CLASS: X ECONOMICS CHAPTER -1 DEVELOPMENT

CHAPTER/TOPIC	WORLD BANK AND UNDP METHOD OF COMPARING COUNTRIES
LEARNING OBJECTIVES	Students will understand the methods of comparing the countries on various aspects.
ACTIVITY DESCRIPTION	World bank uses per capita income as its base for counties comparison. Whereas UNDP comparing the countries on the basis of per capita income, Education level and Health status of People. **MAP ACTIVTY:** In outline map of world mark the following places: (i) Any five countries in highest per capita income (ii) Any five countries in highest literacy rate (iii) Any five countries in highest life expectancy rate.
INSTRUCTIONS	Students will mark the above places on separate world map and paste in activity note book.
LEARNING OUTCOMES	Students will learn about the difference between World Bank method of comparison and UNDP method of comparison.
METHODOLOGY	Individual Map Activity

DEVELOPMENT

CHAPTER/TOPIC	DEVELOPMENTAL GOALS
LEARNING OBJECTIVES	Students will be Understand that different people have different developmental goals and development for one can be destruction for other.
ACTIVITY DESCRIPTION	What may be development for one May not be for the other. It may be destructive for the others. Example: Golden Quadrilateral Super Highways is India's largest highway project, connecting four major cities: Delhi, Mumbai, Kolkata, and Chennai. The GQ is 5,846 kilometres long, making it the longest highway project in India and the fifth longest in the world. **ACTIVITY: Make a list of two different groups of people. The first for whom it has proved to be a development. And others for whom it proved to be destruction.**
INSTRUCTIONS	Individual students will do the above activity in activity notebook. Students will do this activity with help of Technology, Newspaper and other resources.
LEARNING OUTCOMES	To enable studentsto classifying Individual goals and Conflicting goals.
METHODOLOGY	Individual

CLASS: X ECONOMICS CHAPTER -2 SECTORS OF THE INDIAN ECONOMY

CHAPTER/TOPIC	SECTORS OF THE INDIAN ECONOMY
LEARNING OBJECTIVES	Students will understand the fundamental concept of Gross Domestic Product.
ACTIVITY DESCRIPTION	The economy is classified into three sectors: primary, secondary, and tertiary. The sum of production in these three sectors gives the Gross Domestic Product (GDP) of a country. In 2022, the primary sector contributed 21.82% to GDP, the secondary sector contributed 24.29%, and the tertiary sector contributed 53.89%. (iv) **ACTIVTY:** Compare any three countries with the highest GDP with the help of a graph, and find out how the GDP of these countries is so high?
INSTRUCTIONS	Students will use the graph and paste in activity note book and write the reasons of the High GDP in these countries.
LEARNING OUTCOMES	Students will familiarize with the fundamental concept of Gross Domestic Product and they will know how the GDP will calculate.
METHODOLOGY	Individual Activity

CHAPTER/TOPIC	HOW TO CREATE MORE AND BETTER CONDITIONS OF EMPLOYMENT?
LEARNING OBJECTIVES	Students will know the causes of Unemployment.
ACTIVITY DESCRIPTION	There are many different types of employment, from full-time jobs to part-time jobs to contract work. The organized sector offers jobs that are the most sought after. But the employment opportunities in the organized sector have been expending very slowly. **ACTIVITY:** Identify the factors that contribute to good employment conditions and Suggest some ideas of generating or improvement of Employment condition in Each economic sector.
INSTRUCTIONS	Students will be divided into 4 to 5 groups. Ask to choose any one sector for this activity. They discussed with their group members and give the presentation in a class.
LEARNING OUTCOMES	Students to learn more about the different types of employment available, the factors that contributes to good employment conditions, and how to create more and better employment conditions.
METHODOLOGY	Group activities

CLASS: X ECONOMICS CHAPTER -3

CHAPTER/TOPIC	MONEY AND CREDIT
LEARNING OBJECTIVES	• To develop critical thinking skills and deepen the understanding of money and credit through collaborative discussion
ACTIVITY DESCRIPTION	Art integrated activity
INSTRUCTIONS	Activity- Divide students into small groups and assign sections of the chapter for each group to read Instruct students to keep in mind the core points, character development and plot points within their groups.
LEARNING OUTCOMES	• Students will be able to understand the gist of chapter and explain it and present it before others in an outstanding manner. • Students social behaviour will be improved with their body language and emotional well being
METHODOLOGY	Group Activity

ECONOMICS CHAPTER -4 GLOBALISATION AND INDIAN ECONOMY

CHAPTER/TOPIC	GLOBALISATION AND INDIAN ECONOMY
LEARNING OBJECTIVES	The students will be able to.... 1.Understand the concept of Globalisation
ACTIVITY DESCRIPTION	1. Documentary Screening :- Show relevant documentaries orshort films that explore different aspects of Globalisation, such as “Food , Inc.” food globalisation or “The true Cost” for globalisation’s impact on fashion industry or “The 11th Hour” on global environmental challenges. Afterward, facilitate a discussion on the themes and issues raised in the Documentaries.
INSTRUCTIONS	1. The students will be instructed to watch the documentaries carefully and try to relate the Content with day to life. The students will be divided into 4 groups and facilitate a group discussion on the themes of the documentaries And make a group presentation in the class.
LEARNING OUTCOMES	Understand the concept and dimensions of globalization.
METHODOLOGY	Group Activity

CHAPTER/TOPIC	**GLOBALISATION AND INDIAN ECONOMY**
LEARNING OBJECTIVES	The students will be able to.... Globalisation for Foreign trade and integration of market
ACTIVITY DESCRIPTION	1. Global Trade Simulation: Create a simulation where the students take on the roles of Different countries engaging in global trade. students negotiate trade deals with each other , considering factors such as tariffs, quotas and experience the complexities of international Commerce first hand.
INSTRUCTIONS	Divide students into groups , assigning each Group a different country or region. have them research the economy, resources and industries of Their assigned region or country .And make a group presentation in the class.
LEARNING OUTCOMES	1.Explain trade is one of Factors that support to Globalization.
METHODOLOGY	1. Group activity

CLASS: X ECONOMICS CHAPTER -5

Consumer Rights OR Social Issues OR Sustainable Development

Project work

Refer Annexure III

CBSE SOCIAL SCIENCE SYLLABUS 2023-24 (Code No. 087)

SUBJECT: ARTIFICIAL INTELLIGENCE

CLASS X -ARTIFICIAL INTELLIGENCE

ACTIVITY HANDBOOK

INDEX

ACTIVITY 1.1

Objectives: To understand the process of decision making

Topic: Decision Making

The basis of decision making depends upon the availability of information and how we experience and understand it. For the purposes of this article, 'information' includes our past experience, intuition, knowledge, and self-awareness. We can't make "good" decisions without information because then we have to deal with unknown factors and face uncertainty, which leads us to make wild guesses, flipping coins, or rolling a dice. Having knowledge, experience, or insights given a certain situation, helps us visualise what the outcomes could be. and how we can achieve/avoid those outcomes.

Learning outcome:

- To understand what is decision making
- Able to make decisions based on information available
- To understand how to analyse data and to make decisions appropriately

Resources required:

- Regular classroom setup with a projector, computer/ laptop and internet

Instructions:

The Case of the Missing Necklace

- Display the story with clues and ask a student to read it out to the class.
- Give a definite time frame of 15 minutes wherein students should identify the thief and write his justifications in a paper
- After 15 minutes, ask each student to read out his findings and explain his justification.

Example:

In a small town, there's a beautiful museum renowned for its priceless artefacts. Among these treasures is a rare and valuable necklace, known as the "Starlight Jewel," which is said to have magical properties.

One morning, the museum director discovers that the Starlight Jewel has been stolen from its display case. The entire town is buzzing with speculation, and the museum staff is in a state of panic. The police are called in to investigate, and they quickly gather all the museum employees for questioning.

Clues:

1. Security Footage: The museum's security cameras captured footage of the hallway leading to the exhibit room. However, the camera malfunctioned for a brief period, and during that time, the thief entered and left the exhibit room unseen.

2. Employee Schedules: The museum's records show that only three employees were working during the time of the theft: Alice, the security guard; Ben, the janitor; and Claire, the receptionist.

3. Suspicious Behaviour: Witnesses report seeing each of the three employees acting strangely on the day of the theft. Alice was observed fidgeting with the security cameras, Ben was spotted near the exhibit room during his cleaning rounds, and Claire seemed nervous and jittery throughout the day.

Solution:

After careful examination of the evidence and conducting interviews with the museum staff, the police determine the identity of the thief:

The Thief: Claire, the Receptionist

Explanation:

Behaviour: Claire's nervousness and jittery behaviour were a result of her guilt and anxiety about being caught.

Alibi: Alice, the security guard, was later proven to have been occupied with an unrelated security issue during the time of the theft. Ben, the janitor, had no motive or opportunity to commit the crime.

With the evidence pointing towards Claire as the culprit, the police confront her, and she ultimately confesses to the theft. The Starlight Jewel is recovered, and Claire is apprehended, bringing an end to the mystery of the missing necklace.

ACTIVITY 1.2

NOTEBOOK/ ERASER TOWER CHALLENGE:

Objective: Students work in teams to build the tallest freestanding structure using only notebooks/ erasers, all within a limited time frame.

Setup:

1. Provide each team with a set of 30 notebooks/ eraser (any other similar object)
2. Set a timer for the duration of the activity, typically around 20-30 minutes.
3. Designate a clear workspace for each team to work on their tower.

Instructions:

1. Divide students into small teams of 3-4 members.
2. Explain the objective of the challenge: to build the tallest tower possible using the given material, the notebooks/ eraser
3. Set the ground rules, such as no holding the structure, and emphasise that the tower must be freestanding.
4. Encourage students to discuss and plan their approach before starting to build.
5. Once the timer starts, teams begin constructing their towers.
6. Throughout the activity, teams may encounter decision points where they must make choices about the design, stability, and height of their towers.
7. Encourage teams to communicate, collaborate, and adapt their strategies as they encounter challenges.
8. When the time is up, measure and compare the heights of the completed towers.

Debrief:

1. Gather the teams together for a debriefing session.
2. Discuss the decision-making process during the challenge, focusing on the choices made by each team and the factors that influenced their decisions.
3. Encourage students to reflect on the effectiveness of their strategies, the importance of teamwork, and the role of trial and error in problem-solving.
4. Connect the activity to real-life decision-making scenarios, highlighting the importance of creativity, critical thinking, and adaptability.
5. This activity not only makes decision-making tangible and hands-on but also promotes teamwork, communication, and problem-solving skills in a fun and interactive way.

LET'S UNDERSTAND DOMAINS OF AI

ACTIVITY 2.1

Objectives: To understand the computer vision domain of Artificial Intelligence

Topic: Computer Vision

Computer Vision, abbreviated as CV, is a domain of AI that depicts the capability of a machine to get and analyse visual information and afterwards predict some decisions about it. The entire process involves image acquiring, screening, analysing, identifying and extracting information. This extensive processing helps computers to understand any visual content and act on it accordingly. In computer vision, Input to machines can be photographs, videos and pictures from thermal or infrared sensors, indicators and different sources.

Computer vision related projects translate digital visual data into descriptions. This data is then turned into computer-readable language to aid the decision-making process. The main objective of this domain of AI is to teach machines to collect information from pixels.

Learning outcome:

- To understand what is computer vision
- Able to predict the actions associated with the hand gestures
- To understand how different actions are identified by a computer
- To understand and appreciate the concept of computer vision

Resources required:

- Regular classroom setup with a projector, computer/ laptop and internet
- Printed cards/ paper containing various gestures

Instructions:

- Divide the students into small groups or pairs.
- Explain that each group will take turns selecting a gesture card from the board.
- The selected gesture will be performed by one student from the group, while the rest of the group guesses the meaning or message conveyed by the gesture.
- Have one student from the group select a gesture card from the board without showing it to the rest of the group.

- The selected student performs the gesture in front of the group, while the other students observe and try to guess the meaning of the gesture.
- Encourage the guessing students to discuss and collaborate on their interpretations of the gesture before providing their answer.
- After each round, facilitate a group discussion.
- Ask the performing student to reveal the correct meaning or message conveyed by the gesture.
- Encourage the students to share their thoughts on the gesture and how they arrived at their guesses.

- Example:

Game link:

https://artsandculture.google.com/experiment/say-what-you-see/jwG3m7wQShZngw

https://aitestkitchen.withgoogle.com/tools/image-fx

LET'S UNDERSTAND DOMAINS OF AI

ACTIVITY 2.2

Objective: To understand the natural language processing domain of Artificial Intelligence

Topic: Natural Language Processing

Natural Language Processing, abbreviated as NLP, is a branch of artificial intelligence that deals with the interaction between computers and humans using the natural language. Natural language refers to language that is spoken and written by people, and natural language processing (NLP) attempts to extract information from the spoken and written word using algorithms. The ultimate objective of NLP is to read, decipher, understand, and make sense of the human languages in a manner that is valuable.

Learning outcome:

- To understand what is natural language processing
- Able to group sentences based on some logic
- To understand how sentences can be categorised by a computer
- To understand and appreciate the concept of Sentence Sorting

Resources required:

- Regular classroom setup with a projector, computer/ laptop and internet
- Printed sentence cards (with various sentences written on them), use a mix of sentence types, such as questions, statements, commands, and exclamations.
- Large paper or whiteboard for category labels
- Pens or marker

Instructions:

- Divide students into small groups (3-4 members per group).
- Arrange category labels on a visible area of the classroom. Example categories could include "Questions," "Statements," "Commands," and "Exclamations."
- Each group will receive a set of sentence cards.

- The task is to categorise the sentences into the appropriate categories based on their linguistic features.
- Students should discuss and analyse the sentences together as a group to determine their categories.
- Distribute the sentence cards to each group and provide time for them to sort and categorise the sentences.
- Encourage students to read each sentence carefully and consider its structure, syntax, and purpose.
- Guide students to discuss and identify key linguistic features of each sentence that determine its category.
- Have each group place the sentence cards under the corresponding category labels on the paper or whiteboard.
- After sorting the sentences, gather the students for a discussion about their categorization choices.
- Ask students to explain their reasoning behind categorising certain sentences into specific categories.
- Discuss how computers can use similar linguistic analysis techniques in natural language processing tasks.
- Conclude the activity by summarising the key concepts learned about natural language processing (NLP).
- Encourage students to explore further by researching additional examples and applications of NLP technology.

Example:
Here are some sample sentences for a sentence sorting game challenge:

1. The sun rises in the east every morning.
2. Dogs are loyal companions to humans.
3. Photosynthesis is the process by which plants make their food.
4. India was declared a republic in 1950.
5. Exercise is important for maintaining good health.
6. Shakespeare's plays are still performed around the world.
7. The Earth orbits around the sun.
8. Water boils at 100 degrees Celsius.
9. The Great Wall of China is one of the Seven Wonders of the World.
10. Penguins cannot fly but are excellent swimmers.

Based on categories the sentences can be classified as
Science/Nature:

- Photosynthesis is the process by which plants make their food.
- The Earth orbits around the sun.
- Water boils at 100 degrees Celsius.

Geography/History:

- India was declared a republic in 1950.
- The Great Wall of China is one of the Seven Wonders of the World.

Animals/Nature:

- The sun rises in the east every morning.
- Dogs are loyal companions to humans.
- Penguins cannot fly but are excellent swimmers.

Health/Wellness:

- Exercise is important for maintaining good health.

Literature/Arts:

- Shakespeare's plays are still performed around the world.

Game link: https://creatability.withgoogle.com/word-synth

WHAT IS AI? WHAT IS NOT AI?

ACTIVITY 3.1

Objectives: To categorise what is AI and what is not AI?

Topic: what is AI and what is not AI?

Machines become intelligent once they are trained with some information which helps them achieve their tasks. AI machines also keep updating their knowledge to optimise their output.

Any machine that has been trained with data and can make decisions/predictions on its own can be termed as AI.

Artificial intelligence encompasses technologies that enable machines to emulate human intelligence, learn from data, and perform complex tasks autonomously. Systems that rely on predefined instructions, fixed rules, or basic automation without learning or adaptation capabilities are typically not considered AI.

Learning outcome:

- To understand what is Artificial Intelligence
- To understand how AI is different from non AI

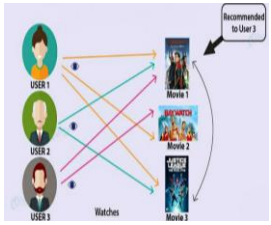
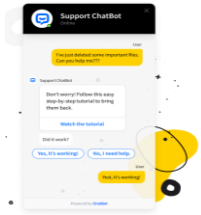
Resources required:

- Regular classroom setup with a projector, computer/ laptop and internet
- Printed cards with examples of AI and non-AI systems
- Large poster board or whiteboard divided into two sections: "AI" and "Non-AI".
- Sticky notes or tape.
- Markers.

Instructions:

- Divide the class into small groups, ensuring each group has access to printed cards with examples of AI and non-AI systems.
- Display the large poster board or whiteboard divided into two sections labelled "AI" and "Non-AI".
- Instruct each group to examine the examples provided on their cards and classify them as either AI or non-AI systems.
- Encourage students to discuss the characteristics of each example and justify their classification decisions within their groups.
- Record all their justification and try to make criteria for differentiating AI and non AI
- After classifying all examples, facilitate a group discussion where each group shares their classifications with the class.
- Encourage students to explain their reasoning behind classifying each example as AI or non-AI and engage in a respectful debate if there are disagreements.
- Encourage other groups to provide feedback or ask questions about the classifications presented.
- Clarify any misconceptions and reinforce key concepts related to AI and non-AI systems based on the discussions.

Example:

		 SPAM SPAM FILTER	
 ChatBot	 alexa		
			
 Recommended to User 3 USER 1 USER 2 USER 3 Movie 1 Movie 2 Movie 3 Watches		 Support ChatBot	

4

AI ETHICS AND DATA PRIVACY

ACTIVITY 4.1

Objectives: To understand the concept of data privacy in AI Ethics.

Topic: Data Privacy

The world of Artificial Intelligence revolves around Data. Every company, whether small or big, is mining data from as many sources as possible. More than 70% of the data collected till now has been collected in the last 3 years which shows how important data has become in recent times. It is not wrongly said that Data is the new gold.

Data privacy, also known as information privacy or data protection, refers to the ethical and legal principles governing the collection, use, disclosure, and management of personal information. It involves ensuring that individuals have control over how their personal data is collected, processed, and shared by organisations, businesses, governments, and other entities.

Learning outcome:

- To understand what is Data privacy
- To understand how data is collected and used
- Able to understand the possible implications of sharing sensitive data

Resources required:

- Regular classroom setup with a projector, computer/ laptop and internet
- Whiteboard or flipchart
- Markers
- Index cards
- Stickers or coloured markers

Instructions:

- Divide the students into small groups and assign each group a "Data Detective" role.

- Provide each group with an index card containing a fictional character profile. Include details such as name, age, hobbies, favourite foods, and social media habits.
- Instruct the groups to create a visual representation of their detective character on the index card using stickers or markers.
- Explain that each group will participate in a scavenger hunt to collect data about their classmates.
- Give each group a list of data points to collect, such as favourite colour, pet's name, birth month, etc.
- Set a time limit for the scavenger hunt and encourage the groups to interact with their classmates to gather the information.
- Reconvene the groups and discuss the data they collected during the scavenger hunt.
- Ask each group to share the types of information they collected and how they obtained it.
- Facilitate a discussion on the potential risks of sharing personal information online, such as identity theft, cyberbullying, and targeted advertising.

PROJECT CYCLE - 4W PROBLEM CANVAS

ACTIVITY 5.1

Objectives: To understand the 4W Problem Canvas in Problem Scoping

Topic: 4W Problem canvas - Problem statement formulation

The AI Project Cycle mainly has 5 stages.

1. Problem scoping
2. Data Acquisition
3. Data Exploration
4. Modelling
5. Evaluation

Starting with Problem Scoping, you set the goal for your AI project by stating the problem which you wish to solve with it. Under problem scoping, we look at various parameters which affect the problem we wish to solve so that the picture becomes clearer.

The 4Ws Problem canvas helps in identifying the key elements related to the problem.

Learning outcome:

- To understand what is Problem scoping
- To understand the step by step in formulating a problem statement using the 4W Problem canvas
- To understand and appreciate the concept of 4W problem canvas

Resources required:

- Regular classroom setup with a projector, computer/ laptop and internet
- Whiteboard or flipchart

Instructions:

- Explain the concept of the 4W problem canvas to the participants. Emphasise that it is a structured approach to problem-solving that helps break down complex issues into manageable components.
- Begin by defining the problem statement or challenge that you want to address. Write it clearly at the top of the whiteboard or flipchart.
- Next by brainstorming and identifying the stakeholders who are directly or indirectly involved in the problem. These may include individuals, groups, organisations, or communities.Write down their responses as bullet points under the "Who" section of the canvas.
- Ask students to brainstorm and identify the key components or aspects of the problem. What are the specific issues or obstacles that need to be addressed? Write down their responses as bullet points under the "What" section of the canvas.
- Consider the spatial or geographical aspects of the problem. Where does the problem occur? Where are its effects felt? Are there specific locations or contexts that are relevant to the problem? Write down location-based information under the "Where" section of the canvas.
- Discuss the underlying reasons or causes behind the problem. Why is this problem important or significant? What are the consequences of not addressing it? Write down the answers under the "Why" section of the canvas.
- Review the information gathered on the 4W problem canvas.

- Facilitate a discussion to identify patterns, connections, and insights about the problem.
- Encourage participants to ask clarifying questions and challenge assumptions.
- Based on the insights gained from the 4W analysis, brainstorm potential solutions or strategies to address the problem.
- Write down actionable steps or initiatives that could help mitigate the problem.

Who? **(Stakeholders)**	**What?** **(issue/ problem/ need)**	**Where?** **(Context/ situation)**	**Why?** **(benefit of solution for them)**
• Who is doing it? • Who does it? • Who should be doing it? • Who else can do it? • Who else should do it?	• What to do? • What is being done? • What else should be done? • What else can be done? • What else should be done?	• Where to do it? • Where is it done? • Where should it be done? • Where else can it be done? • Where else should it be done?	• Why does he/ she do it? • Why do it (how does it benefit)? • Why do it there? • Why do it then? • Why do it that way?

Example

Statement1: Lack of Recycling Awareness in the School

Who? **(Stakeholders)**	**What?** **(issue/ problem/ need)**	**Where?** **(Context/ situation)**	**Why?** **(benefit of solution for them)**
Low awareness and participation in recycling efforts among students, leading to increased waste generation and environmental impact.	Students, teachers, other non teaching staff, and school administrators.	School classrooms, hallways, cafeteria, and outdoor areas where waste is generated.	Lack of recycling awareness is observed during school hours, contributing to the accumulation of non-recyclable waste on school premises. Creating awareness will benefit the stakeholders

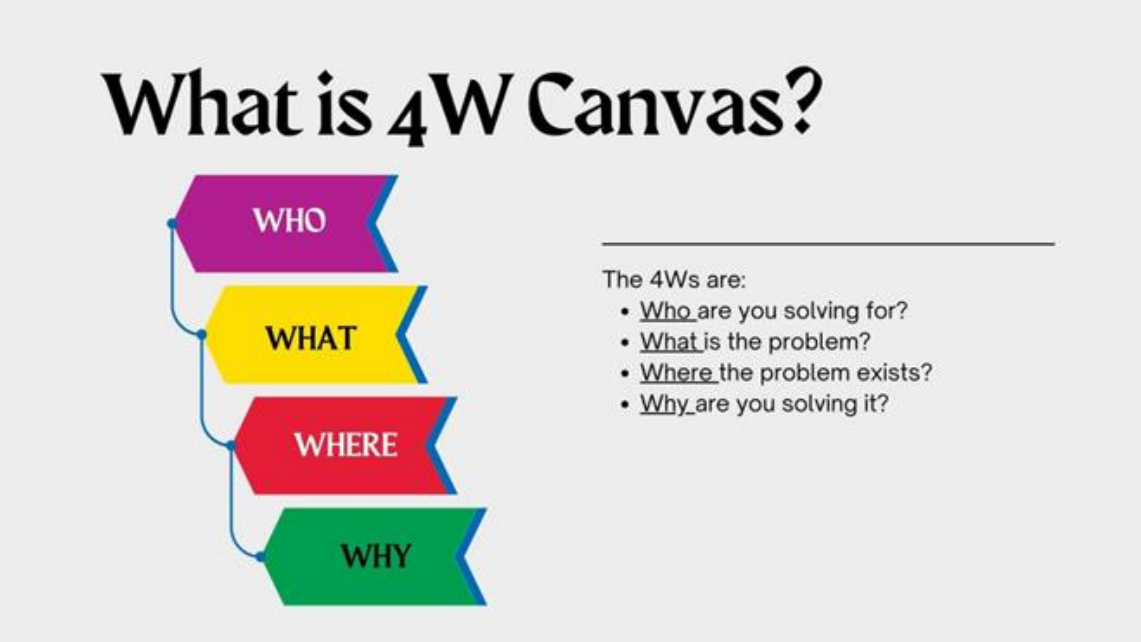
Extended Activity to Prepare 4W Canvas

Statement 1: Limited Access to Technology for Remote Learning

Statement 2: Inadequate Physical Fitness Levels Among Students

Statement 3: Bullying in the School Playground

Statement 4: Student Engagement in Math Classes



SUPERVISED LEARNING MODEL

ACTIVITY 6.1

Objective: To understand Supervised learning model - Regression in AI modelling

Topic: Supervised learning model

In a supervised learning model, the dataset which is fed to the machine is labelled. In other words, we can say that the dataset is known to the person who is training the machine only then he/she is able to label the data. A label is some information which can be used as a tag for data. For example, students get grades according to the marks they secure in examinations. These grades are labels which categorise the students according to their marks.

There are two types of Supervised Learning models:

Classification: Where the data is classified according to the labels. For example, in the grading system, students are classified on the basis of the grades they obtain with respect to their marks in the examination. This model works on discrete dataset which means the data need not be continuous

Regression: Such models work on continuous data. For example, if you wish to predict your next salary, then you would put in the data of your previous salary, any increments, etc., and would train the model. Here, the data which has been fed to the machine is continuous.

Learning outcome:

- To understand what is Supervised learning model
- To understand regression algorithm
- Able to understand and appreciate the concept of Regression

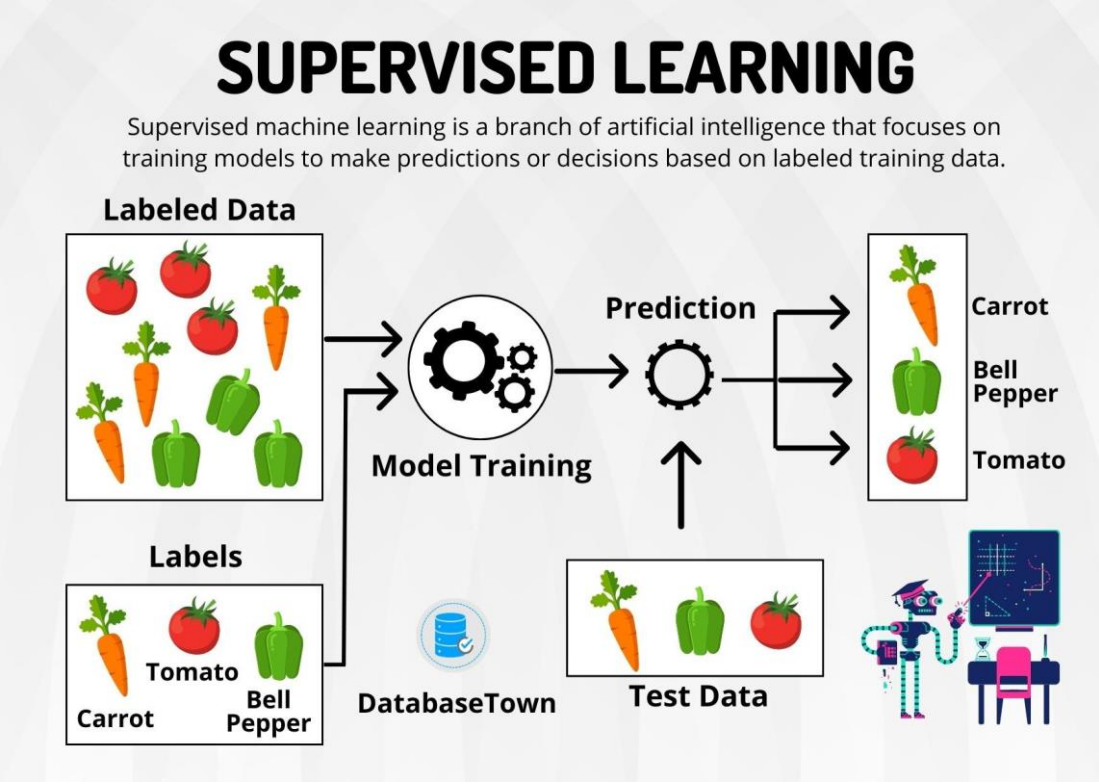
Resources required:

- Regular classroom setup with a projector, computer/ laptop and internet
- Weather data of the locality for the last 15 days.
- Graph sheet
- Paper, pen

Instructions:

- Provide students with weather data for the last 15 days, including information on temperature, humidity, wind speed, and any other relevant variables.
- If possible, students can collect real-time weather data from online sources or use simulated data provided by the instructor.
- Instruct students to analyse the weather data and identify any patterns or trends over the past 15 days.
- Encourage students to use data visualisation techniques, such as charts or graphs, to represent the data and identify correlations between different variables.
- Once the predictions are complete, ask each student to present their weather forecast for the 3 days to the class.

- Encourage students to explain their predictions and the factors they considered when making their forecasts.
- Facilitate a group discussion on the different weather forecasts presented by each student.
- Discuss the similarities and differences between the predictions and any disagreements or uncertainties in the forecasts.
- Encourage students to reflect on the challenges of weather prediction and the importance of using data analysis techniques to make informed forecasts.
- After the discussion, compare the students' predictions with actual weather forecasts for the next week.
- Discuss any discrepancies between the predictions and actual weather conditions, and encourage students to analyse the reasons behind any inaccuracies.



7

UNSUPERVISED LEARNING MODEL-CLUSTERING

ACTIVITY 7.1

Objective: To Understand Unsupervised learning model-Clustering in AI Modelling

Topic: **Unsupervised Learning**

While there are many machine learning models, they can be broadly classified into 3 families. They are supervised learning, unsupervised learning and reinforcement learning. Unsupervised learning focusses on finding patterns or trends out of the data fed to the machine. Every machine learning algorithm requires training data as a base to work upon. Talking about unsupervised learning, the training data fed into this machine is un-labelled i.e. the data fed into the machine is unknown or random. It has not been supervised and hence is given to the machine to get processed in such a way that some meaningful information can be extracted out of it. For example, if in a locality, there are 1000 stray dogs and they are all random bred, if the pictures of all these dogs is fed into an unsupervised learning algorithm, it would automatically cluster these images according to the features observed and would give clusters of images as output. These clusters could be based on any trend or pattern observed in the data fed. This helps in understanding the dataset better.

Learning outcomes:

- To understand what is Unsupervised learning model
- To understand clustering algorithm
- Able to understand and differentiate unlabelled data
- To understand and appreciate the concept pattern matching

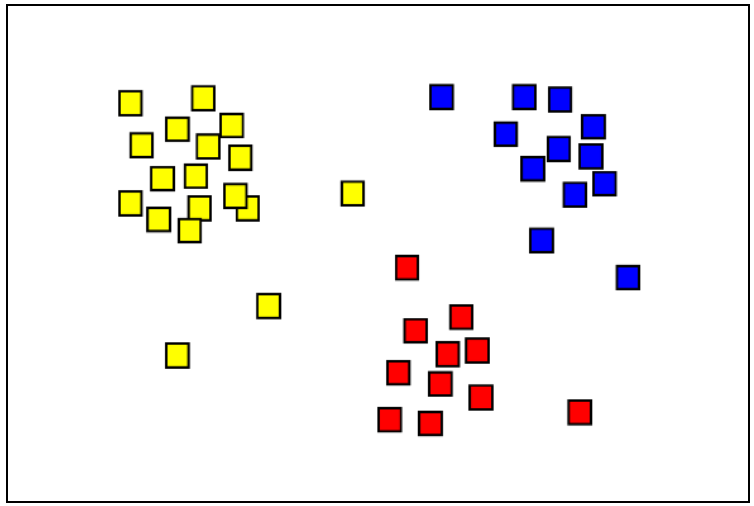
Resources required:

- Students in their house uniforms
- Different sized and shaped beads
- Regular classroom setup which has a Projector, computer/laptop and internet/• computer lab.

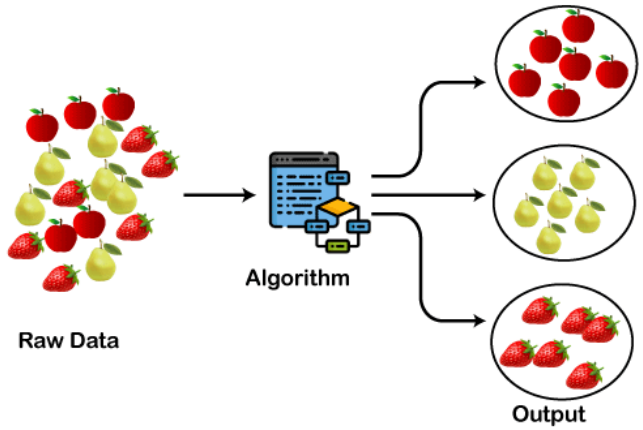
Instructions:

- Ask a student to group the students to two groups and also tell them there should be a reason for their grouping. Initially there might be 2 divisions based on Gender.

- Repeat the exercise by asking the students to make 4 groups. Students might come up the groups based common house uniform.
- Ask them what made them do the reasoning they would come up with the idea of pattern matching. Relate the idea with Unlabelled data and pattern matching.
- Divide the Students in to the groups they have made and hand over some beads to each group and ask the groups to cluster the beads based on the pattern they observe.
- After they complete the exercise ask them the logic behind their clustering (size or color,shape)



Example:



Extended Activity:

Reinforce the concept of unlabelled data and clustering model by the experiment in the weblink activity : Infinite Drum Machine to demonstrate Unsupervised learning .

https://experiments.withgoogle.com/ai/drum-machine/view/

8

DATA SCIENCE -STUDENT MARK PREDICTOR

ACTIVITY 8.1

Objective: To demonstrate a student mark predictor activity to understand the concept of Data science.

Topic: Data science -Student Mark Predictor

Data Science is an interdisciplinary field that utilizes scientific methods, algorithms, processes, and systems to extract knowledge and insights from structured and unstructured numeric data. It combines elements from various fields such as statistics, mathematics, computer science, and domain-specific knowledge to analyse complex datasets and make data-driven decisions.

Learning outcomes:

- To understand the processes involved in a data science based AI model
- Able to identify the data and collect in required format
- Able to do data pre-processing
- Apply a modelling technique using programming tools

Resources required:

- Regular classroom setup which has a Projector, computer/laptop and internet

Software's required:

- Jupyter notebook either online/downloaded and installed

Instructions:

The AI model aims to predict the marks of the student based on the training data given. The training data has two fields Study hours and student marks.

DATA COLLECTION:

- Ask the students to collect the data among their peers by survey per day how many hours they study and what was their percentage in their last exam.

- Arrange them in the form of comma separated values (csv)

```
Studyhrs,studentmarks
5,65.7
2,45.2
4,80.5
5,90.2
And so on
```

- Store it in the form of CSV file student_ info.csv

study_hours	student_marks
5	78.5
6	79.6
7	74.5
4	66.5
4	65.3
5	64.4
5	64.5
6	55.5
3	40.5
3	43.4
8	80.4
8	82.3
8	81.5
6	78.5
6	76.74
7	78.82
7	84.19
6	55.89
7	45.63
8	56.12

- Instruct the students to plot the data points on a graph, with student marks on the y-axis and the chosen parameter (study hours) on the x-axis. If using software, guide them on how to create a scatter plot.

- Calculating Regression Line:

Once the data is plotted, guide the students through calculating the regression line. This can be done manually using the formula for linear regression or using software tools if available. If using software, demonstrate how to add a trendline to the scatter plot.

- Interpretation:

After obtaining the regression line, discuss its significance with the students. Explain how the line represents the best-fit line through the data points and how it can be used to predict student marks based on the study hours.

- Open the Jupyter notebook and run the ipynb notebook

Link for the resources :

- Student_info.csv

https://drive.google.com/file/d/1fh426ymGNxvgAqfYput-iMco13VgxFpi/view?usp=drive_link

- Studentmark predictor.ipynb

https://drive.google.com/file/d/15IBA3bVnQx5ZmSwFkX7Amho1X6U41LgE/view?usp=drive_link

Note: The csv file should be loaded in the application for it to work correctly

- Run through the application to show the way how the application works.

The activity helps to understand how python programming language and its pandas package has a wide range of functions to perform data science operations.

9

COMPUTER VISION-RGB Calculator

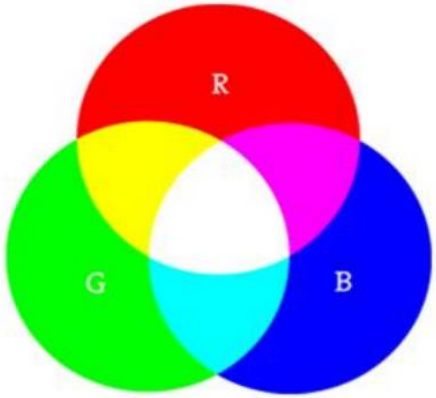
ACTIVITY 9.1

Objective: To practice Image Representation in Computer Vision

Topic: RGB Values of an Image

How do computers store RGB images? Every RGB image is stored in the form of three different channels called the R channel, G channel and the B channel. Each plane separately has a number of pixels with each pixel value varying from 0 to 255. All the three planes when

combined together form a colour image. This means that in a RGB image, each pixel has a set of three different values which together give colour to that particular pixel.



Learning Outcomes:

- To understand the color combination of images
- To understand how computer store different colours using RGB values

Resources required:

- https://www.w3schools.com/colors/colors_rgb.asp
- Paper and Pen

Instructions:

- Ask the students to form a group of 5 students.
- Go for the online tool to know the different RGB values to represent images.

The students should able to answers for the following: -

1) What is the output colour when you put R=G=B=255 ?

2) What is the output colour when you put R=G=B=0 ?

_____

3) How does the colour vary when you put either of the three as 0 and then keep on varying the other two?

_____
_____
_____
_____
_____
_____

4) How does the output colour change when all the three colours are varied in same proportion?

_____
_____
_____
_____
_____
_____

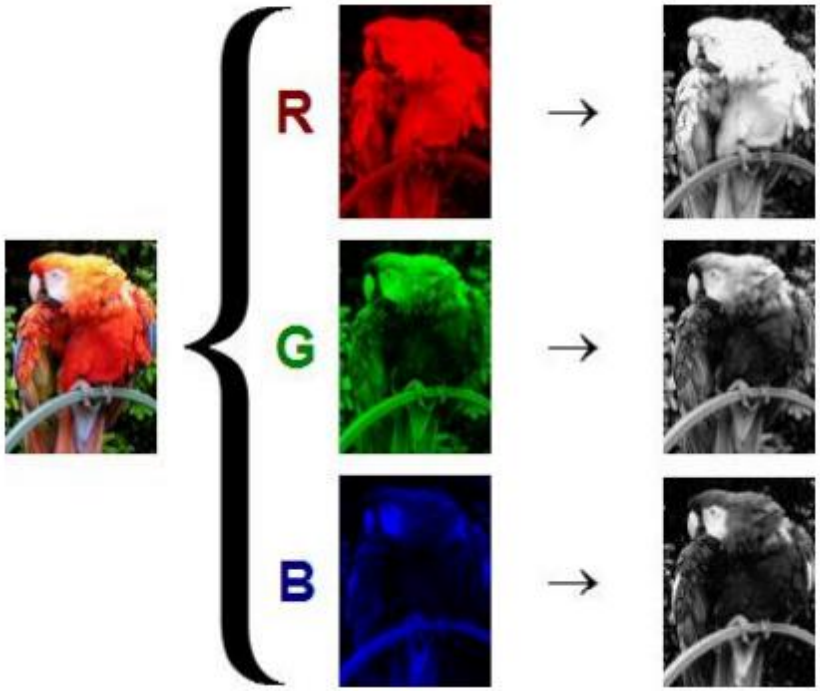
5) What is the RGB value of your favourite colour from the colour palette?

_____
_____

Conclusion

As you can see, each colour image is stored in the form of three different channels, each having different intensity. All three channels combine together to form a colour we see. In the above given image, if we split the image into three different channels, namely Red (R), Green (G) and Blue (B), the individual layers will have the following intensity of colours of the individual pixels. These individual layers when stored in the memory looks like the image on the extreme right. The images look in the grayscale image because each pixel has a value intensity of 0 to 255 and as studied earlier, 0 is considered as black or no presence of colour and 255 means white or full presence of colour. These three

individual RGB values when combined together form the colour of each pixel. Therefore, each pixel in the RGB image has three values to form the complete colour.



Extension Activity

1. Go to the following link piskelapp.com and create your own pixel art. Try and make a GIF using the online app for your own pixel art.

10

IMAGE PROCESSING USING OPEN CV

ACTIVITY 10.1

Objective: To practice Image Processing using OpenCV

Topic: Computer Vision and OpenCV

Computer Vision Computer vision is a field/domain of artificial intelligence (AI) that enables computers and systems to derive meaningful information from digital images, videos and other visual inputs — and take actions or make recommendations based on that information. OpenCV-Python is a library of Python bindings designed to solve computer vision problems. Python is a general-purpose programming language started by Guido van Rossum that became very popular very quickly, mainly because of its simplicity and code readability. It enables the programmer to express ideas in fewer lines of code without reducing readability. OpenCV was started at Intel in 1999 by Gary Bradsky, and the first release came out in 2000. Vadim Pisarevsky joined Gary Bradsky to manage Intel's Russian software OpenCV team. In 2005, OpenCV was used on Stanley, the vehicle that won the 2005 DARPA Grand Challenge.

Learning Outcomes:

- To read and display an image using OpenCV in Google Colab.
- To dsiplay the height and width of an input image.
- To covert BGR format of OpenCV to RGB format.

Resources required:

- Computers/Laptop
- Anaconda Jupyter Notebook with OpenCV package(Open Anaconda prompt and write the following command: pip install opencv-python

Instructions:

Ask the students to form a group of 2 or 3 students

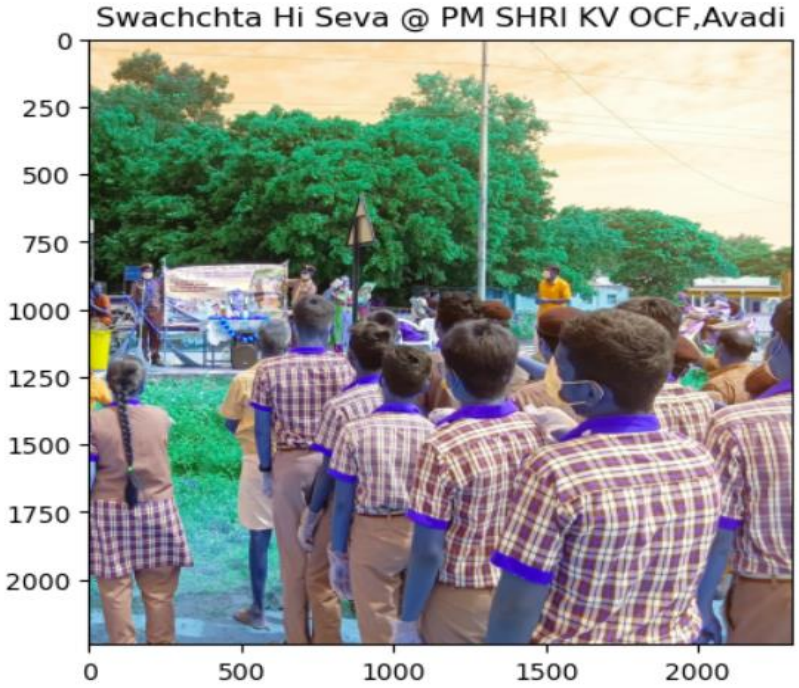
1. Open Jupyter Notebook with Python with Python 3(ipykernal)
2. Import the following libraries:

   We import cv2 to start with Computer Vision Application

   We import matplotlib to display our images on the Jupyter Notebook

   We import numpy to store the pixel values in the NumPy array
3. Display a 2D image using imread() function cv2. Thus, the complete code that appears in Jupyter Notebook will be:

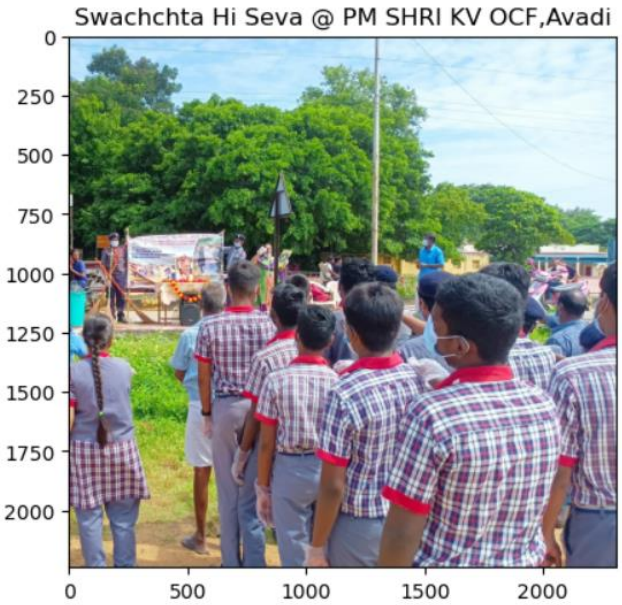
```
In [6]: import cv2 #import OpenCV
        from matplotlib import pyplot as plt # import matplotlib
        import numpy as np # import numpy
        img=cv2.imread('Pictures/img2.jpg') # Load the image file into memory
        plt.imshow(img) #plots the image on the screen
        plt.title('Swachchta Hi Seva @ PM SHRI KV OCF,Avadi')#Display the title
        plt.show()
```



Did you notice that the colour of the images above is not presented properly? This is because OpenCV represents the images in BGR(Blue Green Red) combination instead of RGB(Red Blue Green) so the blue color in images dominates. We will use the following:-

plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))

In [7]:
```
import cv2 #import OpenCV
from matplotlib import pyplot as plt # import matplotlib
import numpy as np # import numpy
img=cv2.imread('Pictures/img2.jpg') # Load the image file into memory
plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))
plt.title('Swachchta Hi Seva @ PM SHRI KV OCF,Avadi')#Display the title
plt.show()
```



To convert image to grayscale, we use
img=cv2.imread('Pictures/img2.jpg',0) *# Load the image file into memory as grayscale*
plt.imshow(img,cmap='gray')

In [8]:
```
import cv2 #import OpenCV
from matplotlib import pyplot as plt # import matplotlib
import numpy as np # import numpy
img=cv2.imread('Pictures/img2.jpg',0) # Load the image file into memory as grayscale
plt.imshow(img,cmap='gray')#cmap with grey specifies color mapping as gray
plt.title('Swachchta Hi Seva @ PM SHRI KV OCF,Avadi')#Display the title
plt.show()
```

Extension Activity

- Go to the following link More examples on OpenCV for practice various image processing operations like cropping, shading, resizing etc.

11 NATURAL LANGUAGE PROCESSING-TEXT NORMALISATION CHALLENGE

ACTIVITY 11.1

Objective: To practice text normalization techniques in natural language processing (NLP).

Topic: Text Normalization in Natural Language Processing

In Text Normalisation, we undergo several steps to normalise the text to a lower level. Before we begin, we need to understand that in this section, we will be working on a collection of written text. That is, we will be working on text from multiple documents and the term used

for the whole textual data from all the documents altogether is known as corpus. Not only would we go through all the steps of Text Normalisation, we would also work them out on a corpus.

Learning Outcome

- To understand the process of Sentence Segmentation, Tokenization, Stemming, Lemmatization etc.

Resources Needed:

- Printed or digital copies of various texts with unnormalized content (e.g., social media posts, emails, news articles)
- Pen and paper or laptops/tablets for students to work on.

Instructions:

Introduction to Text Normalization: Begin by explaining the concept of text normalization to the students. Discuss why it's important in NLP tasks such as text classification, sentiment analysis, and information retrieval.

Example Demonstration: Provide an example of unnormalized text and walk through the process of normalizing it step by step. Show how to handle common normalization tasks such as:

- Converting to common case(Lower case)
- Removing punctuation
- Expanding contractions (e.g., "don't" to "do not")
- Handling special characters
- Removing stop words
- Stemming or lemmatization

Group Activity: Divide the students into small groups and distribute the texts with unnormalized content. Instruct each group to normalize the text using the techniques discussed.

Review and Discussion: Once the groups have completed the normalization task, reconvene as a class to review their work. Have each group share their normalized text and explain the decisions they made during the process.

Evaluation and Feedback: Provide feedback on the normalization efforts of each group. Discuss any challenges they encountered and alternative approaches they could have taken.

Extension Activity (Optional): For advanced students or as an extension of the activity, provide additional unnormalized texts with more complex content. Encourage students to apply more advanced normalization techniques such as entity recognition, spelling correction, or handling of abbreviations and acronyms.

Conclusion:

Wrap up the activity by summarizing the importance of text normalization in NLP tasks and reinforcing the key techniques covered. Encourage students to continue practicing normalization skills on their own using online resources and tools.

Extension Activity:

Kuki Bot	https://chat.kuki.ai/
CleverBot	https://www.cleverbot.com/
Haptik	https://haptik.ai/contact-us
Ochatbot	https://www.ometrics.com/blog/list-of-fun-chatbots/
Activity: Implementation of Text processing, Bag of Words.)	NLP Worksheet (1).pdf - Google Drive
Sentence Segmentation	https://tinyurl.com/y36hd92n
Tokenisation	https://text-processing.com/demo/tokenize/
Stopwords removal	https://demos.datasciencedojo.com/demo/stopwords/
Lowercase conversion	https://caseconverter.com/
Stemming	http://textanalysisonline.com/nltk-porter-stemmer

Lemmatisation:	http://textanalysisonline.com/spacy-word-lemmatize

NLP Worksheet

Text processing, bag of words, tf-idf activity

Suppose you have obtained the following information and you would like to analyse it. Let's start by making it ready for the computer!

Corpus Document 1: We can use health chatbots for treating stress.

Document 2: We can use NLP to create chatbots and we will be making health chatbots now!
Document 3: Health Chatbots cannot replace human counsellors now. Yay >< !! @1nteLA!4Y

Step 1: Sentence Segmentation

No.	Sentence
1	
2	
3	

Step 2: Tokenization

Separate your sentences into tokens. How many tokens do you have?

Tokens

Number of tokens: _____

Step 3: Remove stopwords, special characters, numbers

List out the stopwords, special characters, and numbers that you want to remove!

Stopwords, special characters, and numbers

Step 4: Converting text to a common case

Which text do you need to modify? What is the modified form?

Modified form

Step 5: Stemming

List out the stem words.

Stem words

Step 6: Lemmatization

List out the root words/ lemma.

Lemma

Final data

List out the final, processed data.

Processed data

Congratulations, you've managed to process the data!

Bag of words

Step 1: Collect data and process it

For this exercise, we can use the sentences without processing it so that it is easier for us to read the sentences.

No.	Sentence
1	We can use health chatbots for treating stress
2	We can use NLP to create chatbots and we will be making health chatbots now
3	Health chatbots cannot replace human counsellors now

Step 2: Create dictionary

Make a list of all the different words in the text.

Dictionary

Step 3:Create document vectors

Use the next page to create your document vector!

TF-IDF-TERM FREQUENCY AND INVERSE DOCMENT FREQUENCY

You've obtained your bag of words. Now let's continue with the tf-idf!

Step 1 - 3: Count the number of documents where the word appears at least once & write that number down next to the word in your vocabulary to get your document frequency. Draw your own table for this!

Your document frequency:

Step 4: Get your inverse document frequency.

Your inverse document frequency:

Step 5: Get your TF-IDF

After log operation:

Your tf-idf:

12

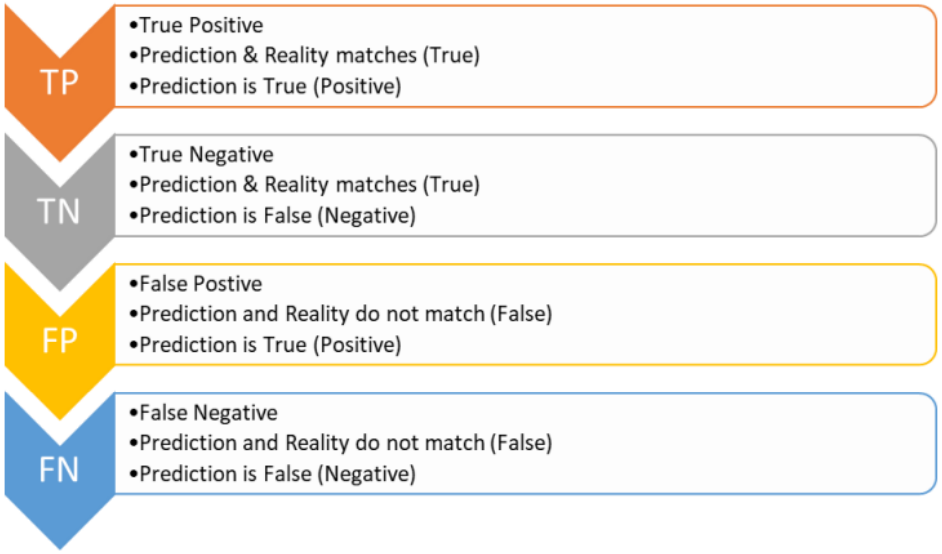
EVALUATION- Constructing Confusion matrix and Finding Evaluation Metrics

ACTIVITY 12.1

Objective: To understand how AI models are evaluated using a confusion matrix.

Topic: Confusion Matrix and Evaluation

The result of comparison between the prediction and reality can be recorded in what we call the confusion matrix. The confusion matrix allows us to understand the prediction results. Note that it is not an evaluation metric but a record which can help in evaluation. Let us once again take a look at the four conditions that we went through in the Forest Fire example: Let us now take a look at the confusion matrix: Prediction and Reality can be easily mapped together with the help of this confusion matrix.



Let us now take a look at the confusion matrix:

The Confusion Matrix		Reality	
		Yes	No
Prediction	Yes	True Positive (TP)	False Positive (FP)
	No	False Negative (FN)	True Negative (TN)

Prediction and Reality can be easily mapped together with the help of this confusion matrix.

Learning Outcome:

- To understand how to use confusion matrix for evaluation of AI Project
- To calculate Accuracy, Precision, Recall and F1 score

Resources Needed:

- Pen and paper

Instructions:

1. Ask the students to form a group of 5 students.
2. Consider a scenario and draw the confusion matrix
3. Calculate Accuracy, Precision, Recall and F1 score.

Scenario: Sudden downpour is a problem faced by a lot of times. People wash clothes and put them out to dry but due to unexpected rain, their work gets wasted. So, an AI model has been created to predict whether it will rain or not. The model has been tested with 100 days and out of the those days in reality it rained 65 days. The Predictions of the model is given below:-
1.The model predicted the rain correctly 35 times
2.The model said there was no rain 20 times when it was actually raining

a) Draw the confusion matrix for the scenario

onfusion Matrix	Reality rue positive	rue Negative
redictive Positive		
redictive Negative		

b) Calculate Accuracy, Precision, Recall and F1score for the same scenario

Reflection and Conclusion:

- Conclude the activity by asking students to reflect on what they've learned about evaluating AI models using confusion matrices.
- Summarize the key points and reinforce the importance of thorough evaluation in AI development.

Extension Activity: Try the online tool

Confusion Matrix - Online Calculator (onlineconfusionmatrix.com)

NOTES: