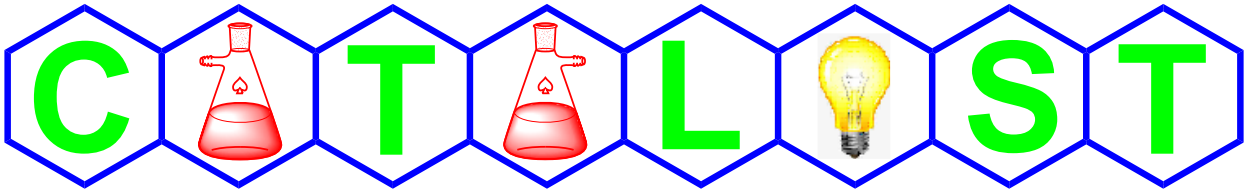
INNOVATIVE PRACTICES



Centre for Advanced Teaching And Learning Yields by Students of Tara

Department of Chemistry has started an innovative program called **CATALYST** (Centre for Advanced Teaching And Learning Yields by Students of Tara) under which group of Teacher-students design and prepares students friendly learning modules. This program also provides the content for curricular and co-curricular activities to create enthusiasm in the chemistry subject. Students with different intellectual levels were segregated and make them two groups. The group of students with fast learning capabilities and academically strengthened records will act as a peer-teacher group which provides the support to the other group in which students are academically backward. The peer teacher group clarified the fundamental doubts of the slow learners and prepares them for upcoming classes and assessments. The catalyst program also prepared teaching modules like ICT enabled PPTs and Charts and models. Further Peer-Learning has been expanded with collaboration with IIT-Hyderabad under PMRF scheme. **CATALYST** also provide suggestions for the preparation of standard teaching plans like online content links of various open

source teaching platforms for effective learning tools for out-side class room support to the low achievers. **CATALYST** also identifies the **CFD** (Concept, Formulae & Definitions) of the various topics for effective learning methodology. In the pandemic situation catalyst plays a significant role in peer learning by using online platforms like zoom for allied curricular transfer.

Some of the innovative activities under CATALYST Programme are detailed below;

Title of the activity:

RANGOLI COMPETITION FOR CREATING INTEREST IN CHEMISTRY

Context:

Rangoli is an art form, originating in the Indian subcontinent, in which patterns are created on the floor or the ground using materials such as colored rice, dry flour, colored sand or flower petals. It is usually made during Diwali or Tihar, Onam, Pongal and other Hindu festivals in the

Indian subcontinent. Designs are passed from one generation to the next, keeping both the art form and the tradition alive.

The purpose of rangoli is decoration, and it is thought to bring good luck. Design depictions may also vary as they reflect traditions, folklore, and practices that are unique to each area. It is traditionally done by girls or women. Generally, this practice is showcased during occasions such as festivals, auspicious observances, marriage celebrations and other similar milestones and gatherings.

Rangoli designs can be simple geometric shapes, deity impressions, or flower and petal shapes (appropriate for the given celebrations), but they can also be very elaborate designs crafted by numerous people. The base material is usually dry or wet powdered rice or dry flour, to which sindoor (vermilion), haldi (turmeric) and other natural colours can be added. Chemical colors are a modern variation. Other materials include colored sand, red brick powder and even flowers and petals, as in the case of flower rangolis.

In this context, Department of chemistry have conducted "Rangoli competition" to create interest in chemistry by using this art form as a media of expressing views of students.

Objective of the Program:

To create interest in chemistry through rangoli as medium of innovative expression.

Date: 7th February 2019.

Nature of the Activity: Rangoli Pattern Designing using Colors.

Coordinator of the Activity: K.Abhijit, Head of the Department.

Number of Students participated: 24

COMPETITION PROFILE DESCRIPTION

Rangoli-1:

Participants: G.Sirisha, B.Sc.(MPC-III)
S. Sushma, B.Sc.(BCCA-III)
T. Anitha, B.Sc.(MPC-III)
P. Shashank, B.Sc.(BCCA-III)

Description:

Shirisha and team expressed ion exchange chromatography through their rangoli, in which they have explained metal ions separation indicated by their original colors in rangoli. They have also drawn naphthalene and camphor chemical structure with Naphthalene and camphor balls. The rangoli was beautifully decorated with lights and flowers which attracts most of the viewers and brought their attention in chemistry which reflected in their art form.


1

Rangoli-2:

Participants: M. Saikiran, B.Sc.(BZC-III),
K. Vikram, B.Sc.(BZC-III),
B. Pavan, B.Sc.(BZC-III),
S. Mohan Raj, B.Sc.(BZC-III),
T. Sushma, B.Sc.(BZC-III),
T. Sujatha, B.Sc.(BZC-III),
M. Mounika, B.Sc.(BZC-III),
P. Maheshwari, B.Sc.(BZC-III)

Description:

Saikiran and team viewed their ideas through rangoli using aromatic rings and lab glass ware like columns, beakers and round bottom flasks which indicated chemistry, along with structures of Chlorophyll and hemoglobin. This represents their group i.e. BZC as Chlorophyll indicates Botany (B), Hemoglobin indicates Zoology (Z) and Glass ware indicates Chemistry(Z). thir creativity was appreciated by viewers.


CH=CH2
CH3
CH2
CH2
COOH
CH2
CH2
COOH
CH3
OCH3

Rangoli-3:

Participants: V. Shobha, B.Sc.(MPC-III),
G. Mounika, B.Sc.(MZC-III),

Description:

Shobha and team viewed their ideas through rangoli using aromatic phenol rings embedded in Lotus flowers. Their rangoli art form was inspired by pairing of electrons and orbital lobes. The rangoli was beautifully decorated with colors and symmetrical proportions of chemical structures.


CHEMISTRY
DEPT

Rangoli-4:

Participants: M. Prasanna, B.Sc.(MPC-III),
R. Manjula, B.Sc.(MPC-III),

Description:

Prasanna and team viewed their ideas through rangoli using aromatic naphthalene rings embedded in Hexagonal benzene ring. Their rangoli art form was inspired by spinning of electrons and orbital lobes. The rangoli also consists glass ware and different heterocycles. The rangoli was beautifully decorated with colors and lights which attracts viewers attention.

Rangoli-5:

Participants: D.Mounika, B.Sc.(MZC-III),
S. Srilatha, B.Sc.(MZC-III),

Description:

Mounika and team viewed their ideas through rangoli using neuro transmitter Dopamine structures and lab glass ware like conical flasks and glass rods along with overlapping of orbitals to form sigma(σ) and pi(π) bonds with symmetrical pattern mixed with ribose sugar molecules. The overall combination of structures and colors made rangoli beautiful and receives viewers appreciation.

Rangoli-6:

Participants: M. Sushmaswaraj, B.Sc.(MZC-III),
K.Priyanka, B.Sc.(MZC-III),

Description:

Sushmaswaraj and team viewed their ideas through rangoli using physical chemistry concepts like electrolysis using voltaic cells and the clock embedded at the centre has a dial in which numbers expressed by elements which has same atomic number to which they are represents. The color combinations and outlines of the patterns were perfectly balanced.

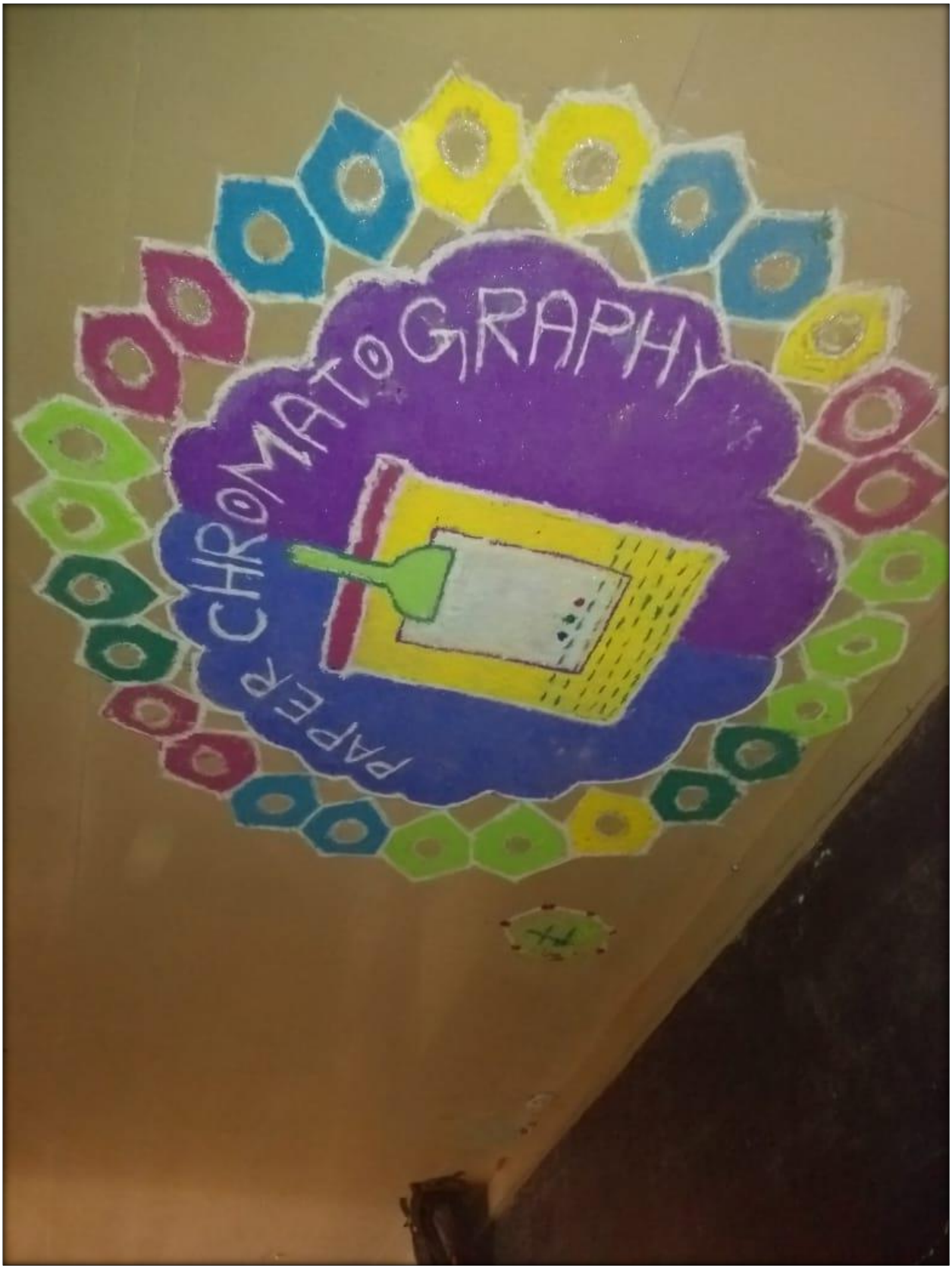

Na Mg H
Ne
He
Li
F
O
N
C
B
Be

Rangoli-6:

Participants: Juweria Amena, B.Sc.(MPC-III),
Ayesha Nazneen, B.Sc.(MPC-III),
Tehreen Begum, B.Sc.(MPCs-III),
Ayesha Afreen, B.Sc.(MPCs-III),

Description:

Juweria and team expressed their views in rangoli using concepts of chromatography. The rangoli has paper chromatography setup which is surrounded by hexagonal aromatic rings in a consecutive manner decorated with different colors. The color combinations and outlines are perfectly designed.


PAPER CHROMATOGRAPHY

PRESS COVERAGE

విద్యార్థుల వినూత్న ప్రయోగం

కొండాపూర్(సంగారెడ్డి): రసాయన శాస్త్రంపై ఆసక్తిని పెంపొందించేందుకు సంగారెడ్డిలోని తారా ప్రభుత్వ కళాశాల విద్యార్థులు గురువారం రసాయన శాస్త్రానికి సంబంధించిన సమీకరణలు, నిర్మాణాలతో ముగ్గుల ద్వారా వినూత్న ప్రయోగం చేశారు. ఈ సందర్భంగా విద్యార్థులు మాట్లాడుతూ ఇలాంటి వినూత్న ప్రయోగాలు చేయడం వల్ల విద్యార్థులకు సృజనాత్మకతతో పాటు శాస్త్ర విజ్ఞానంపై అవగాహన పెరుగుతుందని తెలిపారు. ఇందులో భాగంగా ద్రావణంలోని వివిధ అయాన్‌లను, విభజనను అయాన్ వినిమయ క్రొమటోగ్రఫీ ద్వారా వేరు చేయడాన్ని ప్రత్యేకంగా ఆయా అయాన్‌ల రంగులను ఉపయోగించి ప్రయోగం చేశారు. క్రోమియం(ఆకుపచ్చ), ఫెర్రిక్(పసుపు), కోబాల్ట్ (ఆరెంజ్), మాంగనీస్(పింక్) వంటి అయాన్‌లు సహజసిద్ధంగా పరికల్పన

ముగ్గుల రూపంలో రసాయన సమీకరణలు వేస్తున్న తారా కళాశాల విద్యార్థులు

చేస్తూ ముగ్గుల రూపంలో ప్రదర్శించారు. అదే విధంగా నాఫ్తలిన్ బాల్స్, కర్పూరం గుళికలను ఉపయోగించి ముగ్గులు వేశారు. ఈ కార్యక్రమంలో తారా కళాశాల విద్యార్థులు శిరీష, సుష్మ, శశాంక్, అనిత తదితరులు పాల్గొన్నారు

'తారా'లో చారిత్రక ప్రదర్శన

సంగారెడ్డి అర్బన్, ఫిబ్రవరి 7 : సంగారెడ్డిలోని తారా డిగ్రీ కళాశాలలో చరిత్ర విభాగం ఆధ్వర్యంలో చారిత్రక ప్రదర్శనను గురువారం నిర్వహించారు. దేశంలోని ఢిల్లీ సుల్తాన్, మొగలుల వాస్తు కళ, ఆలయాల కట్టడి, నమూనాలను కళ్లకు కట్టినట్లు ప్రదర్శించారు. చారిత్రక ప్రదర్శనను ప్రిన్సిపాల్ చంద్రముఖర్జీ తిలకించారు. ఈ కార్యక్రమంలో అధ్యాపకులు, విద్యార్థులు పాల్గొన్నారు.

సంగారెడ్డిలోని తారా ప్రభుత్వ కళాశాలలో రసాయన నిర్మాణాలు, ప్రయోగ పద్ధతులను ముగ్గుల రూపంలో ప్రదర్శించిన విద్యార్థులు

Title of the activity:

MY FAVORITE ELEMENT

Elocution competition

Context:

The United Nations General Assembly during its 74th Plenary Meeting proclaimed 2019 as the International Year of the Periodic Table of Chemical Elements (IYPT 2019) on 20 December 2017. Based on the 202 EX/Decision 43, the IYPT2019 was adopted by the UNESCO General Conference at its 39th Session (39 C/decision 60).

1869 is considered as the year of discovery of the Periodic System by the Russian scientist, Dmitri Mendeleev. The IYPT 2019 also commemorates the 150th anniversary of the establishment of the Periodic Table of Chemical Elements. The International Year aims to recognize the importance of the Periodic Table of Chemical Elements as one of the most important and influential achievements in modern science reflecting the essence not only of chemistry, but also of physics, biology and other basic sciences disciplines.

The IYPT 2019 is an opportunity to reflect upon many aspects of the periodic table, including its history, the role of women in research, global trends and perspectives on science for sustainable development, and the social and economic impacts of this field.

In this connection, the Department of Chemistry has conducted elocution competition on "MY FAVORITE ELEMENT". In this activity students have expressed their views about their favorite element and defend them with the knowledge of chemical concepts related to the particular Chemical element of the periodic table.

Objective of the Program:

To create awareness on multifaceted applications of chemical elements in day to day life.

Date: 17th February 2019.

Nature of the Activity: Elocution.

Coordinator of the Activity: K.Abhijit, Head of the Department.

Number of Students participated: 14

Winner: **1. First Prize: G. Shirisha B.Sc.MPC-III-EM**

2. Second Prize: P. Sashank, B.Sc.BCCA-III-EM


DEPARTMENT OF
"My Favourite Element"


"My Favourite


DEPARTMENT OF CHEMISTRY
Favourite Element"

PRESS COVERAGE

యునెస్కో పరిపర్తన పట్టికకు 150 వసంతాలు

సంగారెడ్డి చౌరస్తా: యునెస్కో పరివర్తన పట్టికను రూపొందించి 150 సంవత్సరాలు పూర్తయిన సందర్భంగా యునెస్కో ఈ ఏడాదిని అంతర్జాతీయ ఆవర్తనా పట్టిక సంవత్సరంగా ప్రకటించిందని తారా డిగ్రీ కళాశాల రసాయన శాస్త్ర విభాగధిపతి డాక్టర్ అభిజిత్ తెలిపారు. ఈ మేరకు యునెస్కో సంవత్సరాన్ని పురస్కరించుకొని బుధవారం కళాశాలలో 'నా ఇష్ట మైన మూలకం' అనే అంశంపై రసాయన మూలకాల ప్రాముఖ్యత, అనువర్తనాల గురించి విద్యార్థులకు అవగాహన కల్పించారు. ఈ కార్యక్రమంలో కళాశాల ప్రిన్సిపాల్ డాక్టర్ చంద్రముఖర్జీ, కళాశాల అధ్యాపకులు కె శ్రీధర్, రవికుమార్, మనోజ్‌కుమార్, శ్రావణి, శివదీప్తి, రాంబాబు, రాధా, విద్యార్థులు పాల్గొన్నారు.

EFFORTS TO RESULTS

Publication of international Peer reviewed UGC approved journal by incorporating students into Real time research work

Department of chemistry has taken up best practice in which students of Final year were involved in actual research work to encourage their scientific aptitude. This will help us to create interest in Chemistry among the students in the prospects of higher education in Chemistry. Before the assignment of this project most of the students afraid of the subject but as they were involved in the research work slowly they have starting positive approach towards the subject. The project was focused on practical problem of bio absorption of Phenolic drugs by paddy as most of the students came from rural agricultural areas where pharma companies were established. Students deal the situation with multifaceted approach by incorporating knowledge of not only Chemistry but also biological aspects along with advance level of analysis. The outlook of this project was very encouraging and certainly useful in design newer strategies in the field of Phyto-remediation, the Environmental technology in which pollutants were removed by using plants. The project has concern for Environmental protection and dedicated for Betterment of human society. The challenging part of this project is the Publication of work in genuine and UGC approved journal. After the tremendous hard work of 8 months we are able Succeed to have an international paper from the active research work of the students as it published in Journal of Applicable chemistry, a peer reviewed International UGC approved journal. This achievement also encouraged the students who involved in it to get seats in MSc chemistry in Reputed universities. G. Shirisha of this project got State level First rank in CPGET was proved milestone for both Department of chemistry and Tara Govt (A) college, Sangareddy.

Title of the project:
Quantitative Analysis of Absorption of APAP and ASA by Oryza sativa L.plants under variable pH conditions

Guide Teacher: Dr. Abhijit Kantankar, Asst. Professor of Chemistry

Students involved in project:
G. Sirisha, BSc-III-MPC
M. Prasanna, BSc-III-MPC
Ayesha Nazneen, BSc-III-MPC

S.Sushma, BSc-III-BCCA

ABSTRACT OF THE PROJECT:

Plants do absorb organic compounds efficiently compared to metal ions or other ionic compounds but if the organic compounds quite soluble in water and having active polar functional groups plants can absorbs organic molecules for some extent. Usually amino acids and sugars are absorbed by root cells of plants by contransport with H+. (Baker, 1978; Giaquinta, 1983) but the exact mechanism was still not revealed. PAOMs like drugs having reactive polar functional groups like –OH, -COOH, -NH2 etc. are considerably absorbed by plant's root system. The functional groups of drugs bind with proteins of plasma membranes of root cells and initially get accumulated in roots, from there the accumulated drugs distributed to different parts of plants through phloem due to Osmotic and Pressure gradients. Absorption of APAP and ASA by Oryza sativa L. plants were greatly affected by pH conditions. The optimal pH for maximum absorption were observed at 6.5 for ASA and 5.5 for APAP by oryza sativa L. plants. The quantity of APAP absorbed by 11th leaf Oryza sativa L. plant incubated in medium having pH around 5.5 was enhanced by 24.687

% compared to plants incubated in neutral medium (pH = 7), whereas the increase was only 1.103 %, in the case of absorption of ASA by plants under similar conditions. But at the optimal pH point for ASA absorption i.e. at 6.5 the increase in absorption was 11.067 % compare to plants incubated in neutral conditions.

Title of the Activity:

CHEMICAL ELEMENT'S MANUAL

through

DIGITAL ASSIGNMENTS ON ELEMENTS OF PERIODIC TABLE

On the Occasion of

2019 - International Year of the Periodic Table of Chemical Elements

CC-By-Flickr-COMICLING54

Under

C A T A L S T

Centre for Advanced Teaching And Learning Yields by Students of Tara

ABOUT THE ACTIVITY

The United Nations General Assembly during its 74th Plenary Meeting proclaimed 2019 as the International Year of the Periodic Table of Chemical Elements (IYPT 2019) on 20 December 2017. Based on the 202 EX/Decision 43, the IYPT2019 was adopted by the UNESCO General Conference at its 39th Session (39 C/decision 60).

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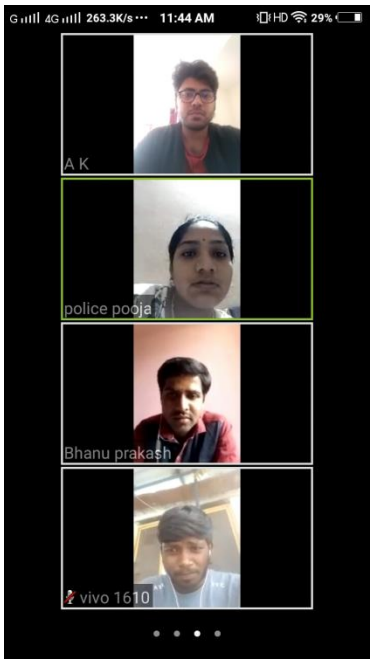
The IYPT 2019 is an opportunity to reflect upon many aspects of the periodic table, including its history, the role of women in research, global trends and perspectives on science for sustainable development, and the social and economic impacts of this field.

In this connection, the Department of Chemistry has conducted Digital Assignments on Elements of Periodic Table under CATALYST program. Students have developed content of different elements which includes their Discovery, Properties and Applications. This content used as study manual for students as a Learning Module.

Peer-Teaching to the Slow Learners in the Pandemic Situation:



Student Research Projects

Research in higher education provides an ample amount of opportunity to explore the applications of academic knowledge in real time issues of day to day life. Research cements the gap between academia and society with respect to incubational knowledge transfer. In Tara Govt. College, Sangareddy (A) research initiatives were designed and implemented with the help of minimal technology interface and with maximum incorporation of student centric innovative ideas. Student centric approache in research programmes have been emerged the backbone of our institute to inculcate the advanced and applied intelligence among the students to make them competent at global level. The research strategy of the institute well aligned the global concerns of environmental sustainability and welfare of humankind by critical analysis of case-points by research groups with complementary amalgamation of students and teachers along with its stake holders.

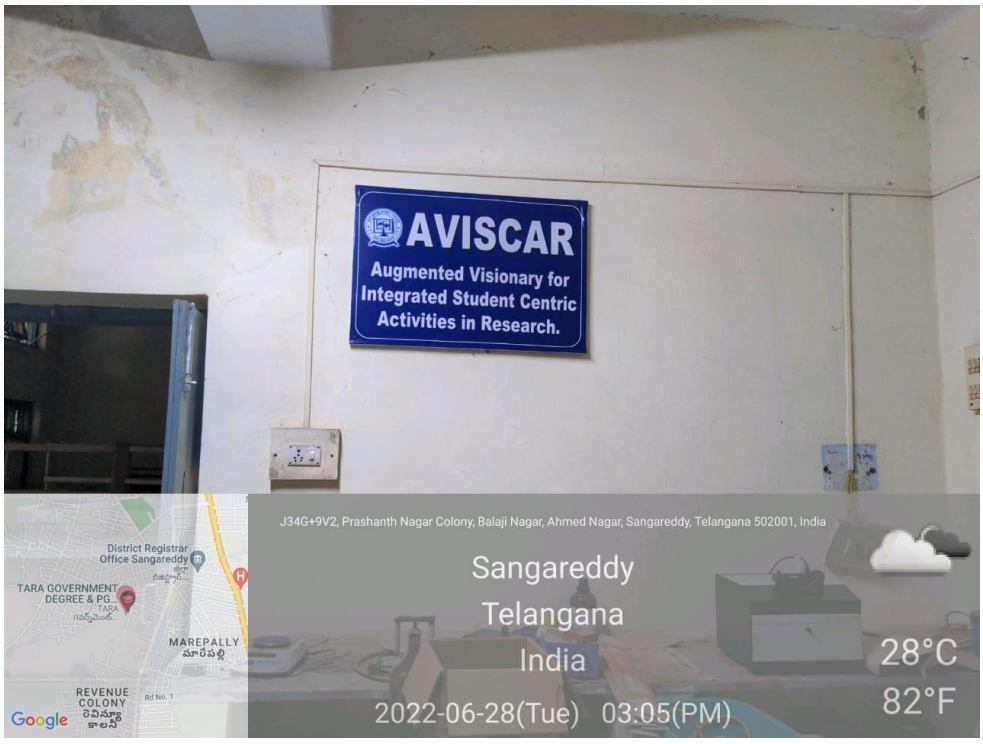
Major Student Research Projects:

- **Spectrophotometric Estimation of Anti-Pyretic Drug Asprin by The Preparation of Fe(III)-Tris-Salicylate Complex in Commercially Available Tablet – Disprin.**
- **Synthesis, Structural Elucidation of New Isoxazole Derivatives and its Anti-Bacterial Activity.**
- **Preparation of Liquid Soap by using long chain fatty acids**
- **Solid state synthesis of Benzoicacid**
- **Modofied Biginelli synthesis of differntly substituted chromone adduct**
- **Ligational aspects of citrate ion with mercury**
- **Adsorption of Chromium on activated charcoal.**
- **Aerobic bacterial content in dairy products.**
- **Adsorption of copper ions by bentonite.**
- **Effect of alkali activation on adsorption capacity of fly ash.**

AVISCAR

(Augmented Visionary for Integrated Student Centric Activities in Research)

Department of Chemistry started the unique platform to encourage the students to participate in active research projects under the programme called **AVISCAR (Augmented Visionary for Integrated Student Centric Activities in Research).** In this programme students were sensitized to research and innovations with unique and feasible approaches. The programme focused on application of academic knowledge in designing and implementing the Research prototypes to solve the specific research problems and obstacles. In this programme students share their views and come up with unique approach where the Teacher provides proper guidance to materialize the idea to be implemented. The student research projects comes under **AVISCAR** programme utilize the existing resources and materials with the motto of "**No-Cost Low Cost**" approaches. The motif of the **AVISCAR** is based on modus operandi, "**Why Not**?" which creates the enthusiasm in the subject through logical and critical thinking of existing knowledge. All the student Research projects designed with interdisciplinary modes which need the divergent academic fusions. The projects designed on fundamentals of the Chemistry as Central science with inter-connected aspects of other branches of Sciences to metamorphose the idea into applications.



OBJECTIVES OF THE PROGRAMME

- Create the interest in students towards Research.
- Application of the academic knowledge to solve the issues pertaining to the day to day life.
- Design the projects based on Green and eco-friendly schemes.
- No-Cost Low-Cost approach should be incorporated in the research.
- Multidisciplinary designs should be adopted to minimize the technical complexity and reduce the cost expenditure.

OUTCOMES OF THE PROGRAMME

Innovative thinking and critical application of academics inculcated in the students to solve the contemporary research problems with minimum resources.

Major Student Research Projects of the AVISCAR:

- **Antimicrobial Silver Nanoparticle coating on Paper currency notes and Mobile phones using Eco-friendly Tollens process for prevention of infectious diseases**
- **Absorption of Zinc-APAP and ASA complexes by Paddy to treat Zinc Deficiency under Different Conditions.**
- **Modified Electro kinetic Phyto remediation by Oryza Sativa using ASA and APAP as facilitating agents.**
- **Innovative Multi-Layered Adsorbent infused Hazardous Chemical Treatment Column for safe disposal of Toxic heavy metal laboratory wastages**
- **Solar cell induced Electro-Kinetic Enhanced Phyto-remediation of Toxic Heavy Metal pollutants from water using Hydrophytic Plants.**
- **Design of Low cost Fume Hood for Chemistry Laboratory using waste materials.**

- **Quantitative Analysis of Absorption of APAP and ASA by Oryza sativa L.plants under variable pH conditions**