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ESTD. 1957

2.3.4 ICT SUPPORT IS USED BY STUDENTS IN VARIOUS LEARNING SITUATIONS

A) 2.3.4 LESSON PLAN/ACTIVITY PLAN/ACTIVITY REPORT TO SUBSTANTIATE THE USE OF ICT BY STUDENTS IN VARIOUS LEARNING SITUATIONS

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ICT support is used by students in various learning situations

1. Understanding theory courses

Preparation of digital album on the life and contributions of a scientist

Students have compiled data and crafted digital albums highlighting various scientists. These albums encompass comprehensive information about each scientist, covering their birth, educational background, early career, notable contributions, accolades received, significant publications, and their passing. Several students have subsequently uploaded these digital albums to their Google Classroom platform. This initiative has proven immensely beneficial for student teachers in gaining a deeper understanding of their respective subject areas. Below is a list of a few of these digital albums.

Sl No	Name of the student	Subject	Name of the scientist and link
1	Aleena Jose	**Physical Science**	**Albert Einstein** **https://drive.google.com/file/d/1JdNlHwjy7JkB6DVUvkp0pXA8UeyTw1sP/view?usp=drivesdk**
2	Archana Madhu	Physical Science	**Mendeleev** https://drive.google.com/file/d/1mdSb7xe-FeOZExrCWWejjxyEfbgreLsh/view?usp=drivesdk
3	Hanna Elizabeth Joy	Physical Science	**C V Raman** https://drive.google.com/file/d/1OcUblNjrNwvLY7OLAdcipAiVtaiYbWA9/view?usp=drive_link
4	Liz Teenu Mathews	Physical Science	**Issac Newton-** https://drive.google.com/file/d/1oiT2UfoyuB0hDo8orRE_gUPhXlo4yOEv/view?usp=drivesdk

5	Ninumol Joseph	Physical Science Education	**Marie Curie** .https://drive.google.com/file/d/13ulPu5qruhq5XOy_1GnF-JRnes2K3M7U/view?usp=drivesdk
6	Gopika Anil	Social Science Education	**Social Scientists** https://drive.google.com/file/d/1_6_KLBVGlLSjv5nMT0ScsKMj2kOqbM_3/view?ts=64de3856
7	Irene Ann George	Physical Science Education	
8	Rinku Maria Joy	Physical Science Education	**S.Chandrasekhar** https://drive.google.com/file/d/1a5zPXeH4DJID6W4_9i7r5iWADXvgSggr/view?usp=drive_link
9	Soniya Dominic	Physical Science Education	**Stephen William Hawking-** http://google.com/presentation/d/1B8lpzYNx7R_5ZlWW9AdY1auhJUEgQ2Ed/edit?usp=drivesdk&ouid=116191355638120297628&rtpof=true&sd=true
10	JosnaJose	Physical Science Education	**APJ Abdul Kalam** https://drive.google.com/file/d/134sz4Xf04bQvUzwXowXftb0BwNM06MI9/view?usp=drivesdk
11	Cyriac Thomas	Commerce Education	**Bruce Henderson** https://drive.google.com/file/d/1CQx3S732FEIkk7YOgoiM8XovsWFE8Wis/view?usp=drivesdk
12	Dinta Baby	Commerce Education	**Abraham Maslow** https://drive.google.com/file/d/11CIxeCqgX3A6Nm1SLrgQb5sdcve4UwVr/view?usp=drivesdk
13	Tom Jose	Commerce Education	**Robert Owen** https://drive.google.com/file/d/1Ga3UR0GqzTMA9Vk9GGvIVAEmlw7hYApl/view?usp=drivesdk
14	Jisha Shaji	Commerce Education	**Elton Mayo** https://drive.google.com/file/d/1zlAAifLi-E0bDOhWKOMyaQU5S8yV9Sv2/view?usp=drivesdk
15		Commerce Education	https://drive.google.com/file/d/1LnF6DPuV_Zv7QIi7zN0UZ87Qkig9QBVq/view?usp=drivesdk
16		Commerce Education	https://drive.google.com/file/d/1iVzAzAiXwEFNMYZRjQl6byuj-Utrnc5y/view?usp=drivesdk

Preparation of digital album on topics in Biology

Students have compiled data and crafted digital albums highlighting various topics in biology. This helped student teachers to understand their concerned subject area. List of few Digital albums are given below.

Sl No	Name of the student	Subject	Name of the topic and link
1	Adithya Shaji	Natural Science Education	**Tissue Engineering** https://drive.google.com/file/d/1lFyx7VcXMlf2eTu4MpOwnxw2wlX90lqW/view?usp=drivesdk
2	Irine Therasa Dius	Natural Science Education	**Plant Tissue Culture** https://drive.google.com/file/d/1X5GKp6pEHGMen6jxPHDOA7zCFXVTXb-8/view?usp=drivesdk
3	Krishna nand H	Natural Science Education	**Triploid** https://drive.google.com/file/d/19y88lVNaOAFq4MYAO1XKj2uIXHznUczE/view?usp=sharing
4	Sneha Jose	Natural Science Education	**Recombinant DNA Technology** https://drive.google.com/file/d/13-5aBJH4C1cTvlCzA9Op6C6m-4QTGLyw/view?usp=sharing
5	Arya Ashok	Natural Science Education	**Ecological Interactions** https://drive.google.com/file/d/1curyNN5JJr87njhoU_f9pcsaq4J-tZ46/view?usp=drivesdk

Preparation Of Programmed Instruction Material Using Branched Programming.

Students created a programmed instructional material using branched programming and uploaded in their own blog.

2. Google classrooms for students of each discipline

The class teachers shared link for google classrooms for their concerned subject. Students joined using the link. Teachers scheduled practical and practicum works through google classrooms and students post their works.

LINK OF GOOGLE CLASS ROOMS 2021-2022

Sl n	Name of the Google Classroom	Google Classroom Link
1	Physical Science Education	https://classroom.google.com/c/MjQzNjMyNzg3MTcx?cjc=ba4s2in
2	B.Ed. 2020-2022 Semester IV English Education	https://classroom.google.com/c/MjE2NDczMjk3MTEz?cjc=opclkwx
3	Semester I EDU 106 Guidance and Counselling	https://classroom.google.com/c/MjQ4OTUzNTc0NTE5?cjc=ddtoot4
4	Commerce Education 2020-2022	https://classroom.google.com/c/MjE2NTEzMjM5MjY0?cjc=e3u26nx
5	Mathematics Education 2020-2022	https://classroom.google.com/c/MjQ0MDc4ODIwNTQ0?cjc=cdk7dmj
6	Sociollect Group	https://classroom.google.com/u/3/c/NDYzMDYzNzEwNTQ0
7	Social Science Education	https://classroom.google.com/u/2/c/NDQyMTk0MTY3NDkz
8	Natural Science Education	https://classroom.google.com/c/MjE2NDUyOTI0MTE4?cjc=pug3vnv
9	Physchology	https://classroom.google.com/c/MjE2NDk5NjUxNjc5?cjc=pai6w4b
10	Commerce Education	https://classroom.google.com/c/MzY4NzA5Mjc1MjIy?cjc=lh4yldm
11	Philosophy	https://classroom.google.com/c/MjQzNDk1OTA2OTY3?cjc=ffxeilx
12	Philosophy	https://classroom.google.com/c/MjQzNDk1OTA2OTY3?cjc=ffxeilx
13	Health Education	https://classroom.google.com/c/MjQ4OTUwMDY4MzU3?cjc=xopzaqv

ICT PROVIDED BY TEACHERS TO STUDENTS

Slo	Google Classroom	Link of You tube provided
1	https://classroom.google.com/c/OTQyOTg0NjM0MzRa/m/NDk2Nzc5MjY0Mzg1/details ks	https://www.youtube.com/watch?v=t2u5mkc5UEk&authuser=0
2	https://classroom.google.com/c/OTQyOTg0NjM0MzRa/m/NDk2Nzc5MjY0Mzg1/details	https://www.youtube.com/watch?v=wNZtI-TiMGo&authuser=0

	ks	
3	https://classroom.google.com/c/OTQyOTg0NjM0MzRa/m/NDk2Nzc5MjY0Mzg1/details ks	https://www.youtube.com/watch?v=vVVPPFOgslA&authuser=0
4	https://classroom.google.com/c/OTQyOTg0NjM0MzRa/m/NDk2Nzc5MjY0Mzg1/details ks	https://www.youtube.com/watch?v=TwZ7LgrPwR0&authuser=0
5	**https://classroom.google.com/c/NDI4Nzg5NjMyNzQ4?cjc=iibmd**	https://youtu.be/oF5j342uTYg
6	**https://classroom.google.com/c/NDI4Nzg5NjMyNzQ4?cjc=iibmd**	https://youtu.be/mEqbJ1sulWA
7	**https://classroom.google.com/c/NDI4Nzg5NjMyNzQ4?cjc=iibmd**	https://classroom.google.com/c/NDI4Nzg5NjMyNzQ4?cjc=iibmdks

Practice Teaching

Students receive instruction in crafting PowerPoint and Prezi presentations, constructing blogs, uploading educational resources onto these blogs, generating learning materials interwoven with ICT elements, and producing educational videos, among other skills. The students prepare **E-learning resource materials** on diverse subjects and they subsequently **provide to the schools they undertake internships**

NAME OF THE E- LEARNING RESOURCE MATERIAL AND LINK (2021-2022)

Sl No	Name of the student	Subject	Name of the E- learning resource material and link
1	Anns Jose	Social Science Education	**Towards the Gangetic plain** https://drive.google.com/file/d/1Wx5ybkUl71cXYLXotNEwDeBrLk-m5xSP/view?usp=drivesdk
2	Annu Sunny	Social Science Education	**Mesopotamian civilization** https://drive.google.com/file/d/10GIru5zVLYtHiUYFBAR3dnSD2y8zF1BS/view?usp=drivesdk
3	Sanchu Jose	Social Science	**Economic planning in India**

		Education	https://drive.google.com/file/d/1Ok3gqRZUX2DjXjqoxXUPonhPAQn-5WPq/view?usp=drivesdk
4	Sisirghosh	Social Science Education	https://classroom.google.com/u/3/g/tg/NDYzMDYzNzEwNTQ0/NDYzMDYzNzExNTU2#u=MTE0MDA
5	Gopika Anil	Social Science Education	**Our government** **https://drive.google.com/file/d/1_6_KLBVGlLSjv5nMT0ScsKMj2kOqbM_3/view?usp=drive_link**
6	Anu Ann James	English Education	**Flights of fancy** https://classroom.google.com/c/NDI5MTk3NzY2MzUy?cjc=ve3xvt3
7	Gouri Gayathri G	English Education	**Mother to son** The castaway Vanka https://classroom.google.com/c/NDI5MTk3NzY2MzUy?cjc=ve3xvt3
8	Archana	Social Science Education	**Early Human Life** https://drive.google.com/file/d/1rhjR2A9fR6PAYd2J2c0dMJnpHKtMgyCi/view?usp=drivesdk
9	Minna Mary Tom	Social Science Education	**Indus Valley Civilisation** https://drive.google.com/file/d/1o94r95a2IQEKBcUm1-Gb8nie3I_tk1jN/view?usp=drivesdk
10	Minu Maria Thomas	English Education	**Glimpses of Green** https://classroom.google.com/c/NDI5MTk3NzY2MzUy?cjc=ve3xvt3
11	Aleena Jose	Physical Science Education	**Effects of Electric current-** https://drive.google.com/file/d/1JdNlHwjy7JkB6DVUvkp0pXA8UeyTw1sP/view?usp=drivesdk
12	Archana Madhu	Physical Science Education	**Gas laws and Mole concepts** - https://docs.google.com/presentation/d/1_-YFIMKrPbYzGwFV3ZsfeNHSgcl1phke/edit?usp=drivesdk&ouid=114784423884340659231&rtpof=true&sd=true
13	Hanna Elizabeth Joy	Physical Science Education	**Energy Management** https://docs.google.com/presentation/d/1IGLoLNMTIvIC3Rvn53A3zKxkQB5Kym76/edit?usp=sharing&ouid=112606750509198481058&rtpof=true&sd=true
14	Irene Ann George	Physical Science Education	**Electricity** https://docs.google.com/presentation/d/1QjktsYXWXauE9tld08PzOtFhEi3Ocj-T6r14NbD3llE/edit?usp=drivesdk
15	Josna Jose	Physical Science Education	**Production of Metals** https://docs.google.com/presentation/d/1CoKGhJwg-vpjYQFpGQWURaRv2hFM5YHN/edit?usp=drivesdk&ouid=108022091736700836560&rtpof=true&sd=true
16	Liz Teenu	Physical Science	**Vision and the world of colors** https://docs.google.com/presentation/d/1HXSafG14cZWyKbm9YpoOzp9

	Mathews	Education	hccDWvj_n/edit?usp=drivesdk&ouid=118251892377366572260&rtpof=true&sd=true
17	Ninumol Joseph	Physical Science Education	**Refraction** https://docs.google.com/presentation/d/1iuEoplNtV0qbasZrWzJfsPzLoKsejil/edit?usp=drivesdk&ouid=108386988716665879101&rtpof=true&sd=true
18	Rinku Maria Joy	Physical Science Education	**Electrochemistry** https://www.canva.com/design/DAE0OtYxmKc/kYUV2MQ6fiV43qvuhNkKRg/view?utm_content=DAE0OtYxmKc&utm_campaign=designshare&utm_medium=link&utm_source=sharebutton
19	Sonia Dominic	Physical Science Education	**Reflection of light-** https://docs.google.com/presentation/d/1E8sxOZ3yvF4ERbvQ6qIWYR6UmMbfPKhD/edit?usp=drivesdk&ouid=116191355638120297628&rtpof=true&sd=true
20	Alina Ann Roy	Commerce Education	**Organising**
21	Dinta Baby	Commerce Education	**Financial Markets** https://classroom.google.com/c/NDI5OTk4MjY2NzI4?cjc=d6coqae
22	Jisha Shaji	Commerce Education	**Marketting** https://classroom.google.com/c/NDI5OTk4MjY2NzI4?cjc=d6coqae
23	Seenu Thomas	Commerce Education	https://classroom.google.com/c/NDI5OTk4MjY2NzI4?cjc=d6coqae
24	Tom Joseph	Commerce Education	**Staffing** https://classroom.google.com/c/NDI5OTk4MjY2NzI4?cjc=d6coqae
25	Haripriya J	Mathematics Education	**Equal triangles** **https://docs.google.com/presentation/d/1fyZ3WfTq7eEtLI71Fu7W1lFKO30iZumn/edit?usp=drivesdk&ouid=105531433598048056137&rtpof=true&sd=true**
26	Jilu Treesa George	Mathematics Education	**Equations** https://docs.google.com/presentation/d/1YwojInHO9pjQk9WbZY5woBI__oLXDoDi/edit?usp=drivesdk&ouid=101183214357438788639&rtpof=true&sd=true
27	Neethu K M	Mathematics Education	**Similar Triangles** https://docs.google.com/document/d/1BclP5C2XUU3-bWyYZeKM3HHuBHfLIHZa/edit?usp=drivesdk&ouid=109190243248152673170&rtpof=true&sd=true
28	Rani Baby	**Mathematics Education**	**Real numbers**
29	Seenu Thomas	Mathematics Education	**Polygons** https://docs.google.com/presentation/d/1bBHcyr1lzBKRCndlORFx62Sr-xMda7BCZ7ZA0yfczZ4/edit?usp=drivesdk
30	Shilpa Joychen	**Mathematics Education**	**Area of quadrilaterals**

31	Vandana V	**Mathematics Education**	**Negative numbers** https://docs.google.com/presentation/d/13n97MxU0UQQzYKbRO1HLqCcIL9zJf_JJ/edit?usp=drivesdk&ouid=112148038332669103571&rtpof=true&sd=tru
32	Adithya Shaji	Natural Science Education	**Chemical messages for homeostasis** https://docs.google.com/presentation/d/1l02GWiua2E2h8pR6GJSYyIWSWFdfpzn/edit?usp=drivesdk&ouid=109074430576274291198&rtpof=true&sd=true
33	Alfred George	Natural Science Education	**Soldiers of defense** https://docs.google.com/presentation/d/1NKm5Pi6ylezFs3mS8YWyk1XIyOk3ryV9/edit?usp=sharing&ouid=111272144645205557470&rtpof=true&sd=true
34	Irine Theresa Dius	Natural Science Education	**Excretion** https://docs.google.com/presentation/d/17--XuhyCs0dAYyB6zvZ8H6fggKUjEPtD/edit?usp=drivesdk&ouid=117621729917755650063&rtpof=true&sd=tru
35	Krishnanand H	Natural Science Education	**Photosynthesis** https://docs.google.com/presentation/d/1FSVkYti7DD0Zq--K5n7fRqS8dCMSGU5Y/edit?usp=sharing&ouid=104879285270936820314&rtpof=true&sd=true
36	Sneha Jose	Natural Science Education	**Respiratory System** https://docs.google.com/presentation/d/1HQvc_XRlf7xs2uunEH-EU6weF-n1KLnY/edit?usp=sharing&ouid=109097303364265616230&rtpof=true&sd=true
37	Arya Ashok	Natural Science Education	**Circulatory System** https://docs.google.com/presentation/d/1vLkwRyVnBGAAcaXXwMtnl2Yj02WZQUUU/edit?usp=drivesdk&ouid=106389412337861486771&rtpof=true&sd=true
38	Pearly S Thomas	English Education	**Bonds of Love** https://docs.google.com/presentation/d/15HFqLGMM4ZPhhHgqm8E97rAO0FIph/edit?usp=drivesdk&ouid=110977654340795929918&rtpof=true&sd=true
39	Suman Sunny	English Education	**Enlightening Souls** https://drive.google.com/file/d/1aeeOT1dYwEVtmPsy6yX9vno7wcFK0EVH/view?usp=drivesdk
40	Sreelakshmi	English Education	**Flowers and Showers** https://drive.google.com/file/d/1gYR3m6D90Bh5NkyM8Z4fT-32OGzMHRvO/view?usp=drivesdk

4. Out of classroom activities

A) You-tubes Created by Students

Sl No	Subject	You tube link
1	Health Club	https://youtu.be/L3EmfGN47js
2	Health Club	https://youtu.be/I0vPTGPse1E

B) Flip Magazines created by Students

No	Club/Name	Link
1	Social Science Club **Sociollect**	https://online.fliphtml5.com/jbhov/buqf/#p=1
2	English Club **Hayat**	https://online.fliphtml5.com/hlkyj/jpns/?1659764301775
3	Mathematics Club **Mathopedia**	https://online.fliphtml5.com/uhdfe/mwpj/?1661355931477
4	Special Education **Uyare**	https://online.fliphtml5.com/jbhov/hgec/?1644162996465#p=1

DISCUSSION TEACHING MANUAL-1

I- GENERAL INFORMATION

Name of the teacher	: Hanna Elizabeth Joy	Subject	: Chemistry
Name of the school	:	Unit	: Compounds of Non-metals
Standard	: X	Topic	: Ammonia
Division	:	Time	: 40 minutes
Strength	:	Date	: 06/06/2022

II CONTENT OVERVIEW

The content for the present discussion teaching manual includes properties, uses and preparation of ammonia.

III CONTENT ANALYSIS

i) TERMS : Ammonia, liquid ammonia, Liquor Ammonia, Quicklime

ii) FACTS :→ When $Ca(OH)_2$ is added to NH_4Cl and stir well, Pungent smelling gas is produced.

→ Ammonia turns red litmus to blue

→ Ammonia has a pungent smell

→ Ammonia is colourless.

→ When ammonia is taken in a round bottom flask and dipped in a beaker containing water.

→ Ammonia in the water rises in the jet tube and water spreads as fountain

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iii) CONCEPTS :→ Ammonia is an important raw material for the production of nitrogenous fertilizers.

→ Ammonia is essential for the growth of plants.

→ Quick lime is used to remove the moisture during ammonia preparation.

→ Ammonia is highly soluble in water

→ Ammonia is basic in nature

→ Ammonia is used for the manufacture of chemical fertilizers like ammonium sulphate, ammonium phosphate and urea.

→ As a refrigerent in ice plants

→ It is used to clean tiles and window panes

→ Ammonia gas can be liquified easily by applying pressure

iv) DEFINITIONS :→ A highly concentrated aqueous solution of ammonia is called liquor ammonia.

→ Liquified ammonia is known as liquid ammonia.

v) EQUATIONS :→ $NH_3 + H_2O \rightarrow NH_4OH$

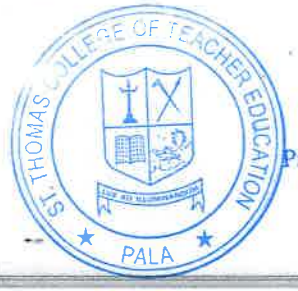
→ $2NH_4Cl + Ca(OH)_2 \rightarrow CaCl_2 + 2H_2O + 2NH_3$

vi) FORMULAES :→ NH_4Cl, $Ca(OH)_2$, CaO, NH_3

vii) PROCESS :→ Haber process

Industrial preparation of ammonia is Haber process

IV LEARNING OBJECTIVES



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i) KNOWLEDGE DOMAIN:

The pupil acquires knowledge regarding the above mentioned terms, facts, concepts, definitions, equations, formulae and process.

Specific objectives :

→ Recalls the use and properties of ammonia in daily life

→ Describes the classroom preparation of NH_3

→ Translates the statement regarding laboratory preparation of ammonia into chemical equation.

→ Recognizes that ammonia is basic in nature.

→ Lists the apparatus used in the laboratory preparation of ammonia.

→ Recognizes that CaO is a drying agent.

→ Recognizes the common name and chemical name of CaO.

ii) PROCESS DOMAIN:

The pupil develops process skills required to develop the knowledge and understanding of the above mentioned terms, facts, concepts, definitions, equations, formulae and process.

Specific objectives :

→ Observes the steps in the laboratory preparation of NH_3 by watching a video.

→ Organizes concepts and ideas regarding the properties and preparation of ammonia

→ Draws the shape of various apparatus used in the laboratory preparation of ammonia

→ Defines the concepts namely liquor ammonia and liquid ammonia operationally.

→ Draws inferences regarding the properties of ammonia namely basic nature, solubility in water and density.

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→ Raises question on passing of ammonia through drying tower and collection of NH_3 in inverted gas jar.

→ Formulates hypothesis regarding the use of inverted gas jar and the use of drying tower in the laboratory preparation of ammonia.

iii) APPLICATION DOMAIN :

The pupil applies above mentioned knowledge and understanding in reward unfamiliar situations.

Specific objectives :

→ Applies the ideas and concepts related to the properties of ammonia in daily life situations.

→ Consolidates ideas related to the properties of NH_3 namely basic nature, solubility in water and density.

→ Generalizes ideas regarding collection of gases which are less denser than air and passing gases through drying tower to remove the moisture content.

→ Relates the ideas and concepts related to properties of ammonia in agricultural sector.

→ Making decisions regarding the use of NH_3 in daily life situation especially in agricultural sector.

→ Analyses unknown situations to check the applicability of ammonia and its properties.

IV) CREATIVITY DOMAIN :

The pupil develops creative abilities by learning the topic ammonia and its properties.

Specific objectives :

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→ Gives multiple responses to the open-ended questions regarding the use of inverted gas jar, drying tower etc.

→ Visualises images related to the shapes and arrangements of apparatus in the laboratory preparation of NH_3.

v) ATTITUDINAL DOMAIN :

The pupil develops scientific attitudes and values related to the topic preparation and properties of NH_3.

Specific objectives :

→ Develops friendly and positive relationships through classroom activities

→ Develops self confidence through group interaction

→ Develops positive attitudes oneself through group interaction

→ Develops spirit of teamwork, self help and self reliance.

V LEARNING STRATEGIES

i) Demonstration

ii) Group activity

iii) Group discussion.

VI SUBJECTIVE REALITY

i) Preconception : Students may have learn about density, solubility, colour change of litmus paper and importance of ammonia in plant growth

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ii) Mis-conception : Not identified any

VII LEARNING RESOURCES

i) Glassware/Apparatus : watch glass, test tube, litmus paper, glass rod.

ii) Chemicals/Consumers : Ammonium chloride and calcium hydroxide ($Ca(OH)_2$)

iii) Audio-visual aids : Videos showing the laboratory preparation of Ammonia and basic nature.

VIII PRECAUTIONS : Chemicals should be handled with care.

IX CLASSROOM TRANSACTIONS

PROCESS/ACTIVITY	EVALUATION/RESPONSE
SENSITISATION (3 mts) Students observe the pictures of certain nitrogenous fertilizers (Ammonium sulphate, ammonium phosphate, urea etc. Students give answers to the following questions. 1) Are you familiar with these chemical compounds? 2) which is the common element present in these compounds? 3) what is the importance of these compound in agriculture and Industrial sectors? 4) Have you studied any of the nitrogen compound? Let us learn more about ammonia today.	i) Participation in group activities ii) Concept formation iii) Skill acquisition iv) Reporting/Recording v) Presentation.

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SESSION -1

DEMONSTRATION (4 mts)

Students observe the following experiment

Take a little NH_4Cl in a watch glass and add a little calcium hydroxide ($Ca(OH)_2$) to it & stir well. Show blue and red litmus paper over the watch glass one by one.

Observation tips

- Sense the smell
- Colour change of the litmus paper

GROUP DISCUSSION (10 mts)

Students discuss the following questions in groups, find out answers, record in their science diary and present in the whole group.

DISCUSSION TIPS

1) which is the gas produced ?
2) what is the odour of ammonia ?
3) what is the colour of ammonia ?
4) what is the colour change of litmus papers ?
5) what do you infer from this ?
6) How can we prepare ammonia in the classroom ?

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7) What is the importance of ammonia in agricultural sector ?

ANSWERS

1) Ammonia
2) Pungent
3) Colourless
4) Red to blue
5) Ammonia is basic
6) $NH_4Cl + Ca(OH)_2 \rightarrow NH_3$
7) Essential for plant growth

CONSOLIDATION

Ammonia is a colourless pungent smelling gas it is prepared by mixing NH_4Cl & $Ca(OH)_2$ in a watch glass. Stirring it well. It is basic in nature. It is an important raw material for the production of nitrogenous fertilizers which is essential for the growth of plants.

GROUP ACTIVITY [5 mts]

Students observe the video presentation of laboratory preparation of ammonia. They also observe the following figure showing the laboratory preparation of ammonia (NPF)

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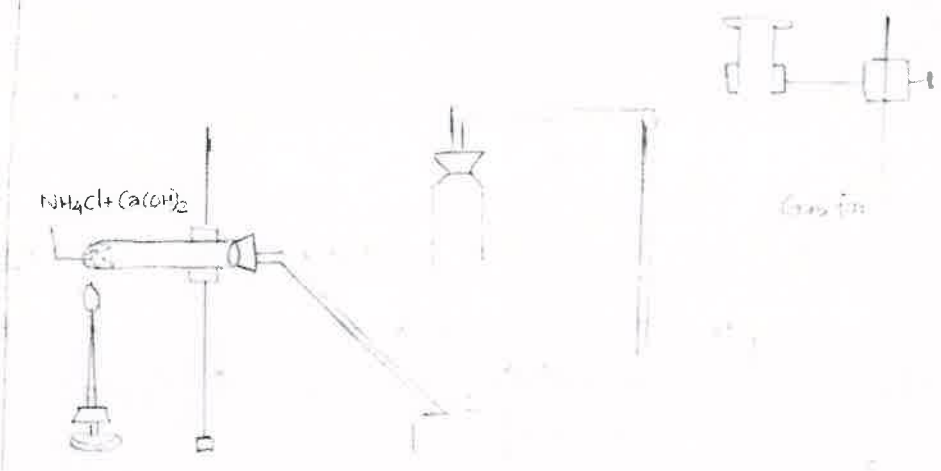

Observation tips

- Reactants and products
- Apparatus used
- Position of gas jar.

GROUP DISCUSSION II (7 mts)

Students discuss the following questions in groups, find out answers, record in the science diary and present in the whole group.

DISCUSSION TIPS

1) which are the apparatus shown in the figure?

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2) which are the reactants and products ?

3) Write the balanced equation.

4) which is the compound used in drying tower ?

5) Why is ammonia gas passed through quick lime ?

6) What is a drying agent ?

7) what is the common name of CaO ?

8) What is the position of gas jar ?

9) what may be the reason for collecting ammonia in this manner ?

10) what is your inference about the density of ammonia from this ?

11) Draw the shapes of various apparatus shown in the figure

ANSWERS

1) Test tube, drying tower, gas jar

2) NH_4Cl and $Ca(OH)_2$ are reactants and NH_3 is the product

3) $2NH_4Cl + Ca(OH)_2 \rightarrow CaCl_2 + 2H_2O + 2NH_3$

4) CaO

5) To remove the moisture

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6) Something which removes moisture

7) Quick lime

8) Inverted

9) The density of NH_3 is lighter than air

10) Lighter than air

11) 

CONSOLIDATION

Ammonia is prepared by heating NH_4Cl with $Ca(OH)_2$ and balanced chemical equation is $2NH_4Cl + Ca(OH)_2 \rightarrow CaCl_2 + 2H_2O + 2NH_3$. Ammonia gas is passed through a drying tower containing quick lime (CaO) to remove the moisture present in it & collected in an inverted gas jar since it is less denser than air.

SESSION-II

GROUP ACTIVITY-I (8 mts)

Students observe the video presentation of experiment demonstrating the solubility of ammonia in water, which is described as follows. They discuss the

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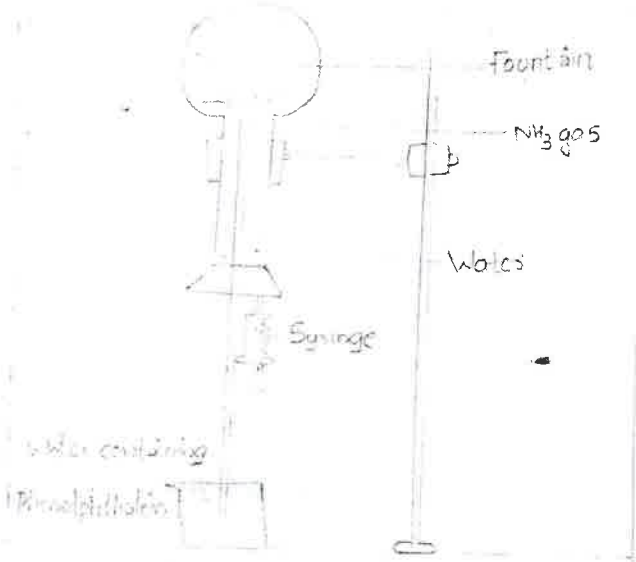
following questions in groups, find out answers, record in the science diary and present in the whole group.

Arrange the apparatus as shown in the figure. Dip the jet tube in the beaker containing water, in which some phenolphthalein is added. Using a syringe add a few drops of water into the flask in which ammonia is taken.



Observation tips

- Movement of water
- Colour of water

DISCUSSION TIPS

1) what do you observe in the video ?
2) why does water rush into the flask ?
3) what is your inference about solubility of ammonia in water ?
4) why does water entering the flask change its colour ?

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5) which property of ammonia is responsible for this colour change ?

6) what is the product obtained when ammonia is dissolved in water ?

7) write the chemical equation of the above mentioned reaction .

ANSWERS

1) water rises upwards like a fountain

2) change in vapourpressure

3) Ammonia is highly soluble in water.

4) Ammonia is basic in nature .

5) Basic

6) Ammonium hydroxide

7) $NH_3 + H_2O \rightarrow NH_4OH$

CONSOLIDATION

Ammonia is highly soluble in water . A highly concentrated aqueous solution of ammonia is liquour ammonia . Ammonia gas is liquified easily by applying pressure . Liquified ammonia is known as liquid Ammonia .

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X APPLICATION

Q_1. When an ammonia tanker leaks, water is sprayed to reduce its intensity. What is the reason for this?

A_1. Ammonia is highly soluble in water.

Q_2. How do you check for ammonia leak?

A_2. By observing its pungent smell or by testing with a litmus paper.

XI FOLLOW UP ACTIVITIES

i) Written Assignment

1) Explain laboratory preparation of ammonia with a neat labelled diagram.

2) Describe an experiment to demonstrate water solubility and basic nature of ammonia.

ii) Activity Assignment

Prepare a list of ammonia fertilizers used in your vegetable garden and agriculture by discussing with your parents.

XII REFLECTION NOTES

i) My findings

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ii) Follow up activities and Remedial measures.

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DISCUSSION LESSON PLAN - II

I GENERAL INFORMATION

Name of the teacher	: Hanna Elizabeth Joy	Subject	: Physics
Name of the school	: St. Thomas H. S. Pala	Unit	: Vision and the world of colours
Standard	: X	Topic	: Dispersion of light
Division	:	Time	: 40 min
Strength	:	Date	: 14/06/2022

II CONTENT OVERVIEW

The content of the present teaching manual includes the topic 'Dispersion of light.'

III CONTENT ANALYSIS

i) TERMS : Composite light, Dispersion, visible spectrum

ii) FACTS : When torch light passes through a prism obliquely, it gets splitted into different colours.

→ White torch light gets splitted by passing through a prism obliquely, red colour is seen on top and violet on bottom

→ Seven colours obtained on the screen are violet, Indiga, blue, green, yellow, orange, red

→ Colour of the sky during sunrise appears to be red

→ Sky appears in blue colour

→ When water is sprayed into the atmosphere facing away from the sun, rainbow is observed

→ When the rainbow is seen in the east, the sun will be in the west

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→ when the rainbow is seen in the west, the sun will be in the east.

→ Combination of green and red gives yellow colour.

→ Combination of green and blue gives cyan.

→ Combination of blue and red gives magneta.

ii) CONCEPTS :→ Light undergoes refraction when it enters the prism obliquely and when it comes out of the prism.

→ when the position of the sun is near the horizon, the rainbow appears to be bigger.

→ when seen from an aeroplane, the rainbow is seen as a circle.

→ when the sun is much above the horizon, the rainbow disappears.

→ when constituent colours are mixed together, we obtain white light.

→ Composite light is composed of more than one colour.

→ when composite light splits into its constituent colours when passed through prism,

→ violet colour has the shortest wavelength and red colour has the longest wavelength.

→ when light passes through the prism, extent of deviation of colours depends on the wavelength.

→ Dispersion of light caused by the water droplets in the atmosphere causes rainbow.

iii) DEFINITIONS → Any light that is composed of more than one colour is a composite light.

→ Dispersion is the phenomenon of splitting up of a composite light into its constituent colours.

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IV LEARNING OBJECTIVES

i) KNOWLEDGE DOMAIN :

The pupil acquires knowledge regarding the above mentioned terms, facts, concepts and definitions.

Specific objectives :

→ Recalls the colour of the sky during sunrise and sunset

→ Recognizes the constituent colours of white light

→ Compares the deviation of light of different colours during dispersion

→ Identifies the relation between the wavelength of light and deviation of light

→ Cite examples for dispersion of light from daily life

ii) PROCESS DOMAIN :

The pupil develops the process skills required to develop the knowledge and understanding of the above mentioned terms, facts, concepts and definitions.

Specific objectives :

→ Organizes concepts and ideas related to dispersion

→ Raises questions regarding the deviation of different colours of light during the experiment showing dispersion

→ Draws diagram showing the splitting of white light through a prism.

→ Represents the relation between wavelength and dispersion graphically.

→ Formulates hypothesis regarding the difference in the deviation of various [illegible] is passed through a prism.

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iii) APPLICATION DOMAIN :

The pupil applies above mentioned knowledge and understanding in new and unfamiliar situations

Specific objectives

→ Applies ideas and concepts related to dispersion of light in daily life

→ Consolidates ideas related to the formation of rainbow

→ Establishes relationship between wavelength and dispersion of light

→ Generalises the hypothesis regarding the position of sun and formation of rainbow.

iv) CREATIVITY DOMAIN :

The pupil develops creative abilities by learning the topic dispersion of light.

Specific objectives :

→ Gives multiple responses to open ended questions regarding splitting of light through a prism.

→ Visualises images and ideas related to increase in deviation of colours in white light as wavelength decreases.

v) ATTITUDINAL DOMAIN :

The pupil develops scientific attitudes and values related to the topic dispersion of light.

Specific objectives

→ Develops friendly and positive relationships through classroom activities

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→ Develops self confidence through group interaction

→ Develops positive attitude oneself through group interaction

→ Develops spirit of team work, self help and self reliance.

V LEARNING STRATEGIES

i) Demonstration

ii) Group activity

iii) Group discussion

VI SUBJECTIVE REALITY

i) Preconception : Students may have learned the concepts like refraction, wavelength

ii) Misconception : Students may think that shape of rainbow is circle.

VII LEARNING RESOURCES

i) Glassware/Apparatus : Prism, torch, screen, black paper

ii) Chemicals/Consumers : Nil

iii) Audio-visual aids : video demonstrating the formation of rainbow

VIII PRECAUTIONS : Take care while handling the prism

IX CLASSROOM TRANSACTION

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PROCESS/ACTIVITY	EVALUATION/ RESPONSE
SENSITISATION (3 mts) Students watch the video presentation on the formation of rainbow. Students give answers to the following questions. 1) Haven't you seen rainbow? 2) What do you know about rainbow? 3) How many colours are present in it? 4) What is the shape of rainbow? Students raise questions regarding the formation of rainbow SESSION-1 GROUP ACTIVITY-1 (7 mts) Students do the following activities in groups. 1) Pass sunlight through a prism and allow it to fall on a screen **Observation tips** • Path of light • Splitting of colour	i) Participation in group activities ii) Concept formation iii) Skill acquisition iv) Reporting/Recording v) Presentation

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2) Affix a black paper with a hole on the glass cover of a torch. Arrange a screen and place a prism between the torch and the screen. Let the beam of torch light fall obliquely on the prism.

Observation tip

- Arrangement of colours on the screen.

GROUP DISCUSSION - 1 (10 mts)

Students discuss the following questions in groups, find out answers, record in the science diary and present in the whole group.

DISCUSSION TIPS

1) What do you observe on the screen ?
2) What are the colours seen on the screen ?
3) Through which medium light passes ?
4) What happens when light is passed through the prism ?
5) What is the nature of light ? Is it sunlight alone gets splitted like this ?
6) Why did this splitting occurs ?
7) What kind of light is this ?
8) Write the colours obtained in order ?
9) In what way should light falls on the prism to get splitted ?

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ANSWERS

1) Seven colours
2) Indigo, blue, violet, red, green, orange
3) Glass
4) Splitting of colours
5) Sunlight, No. white light gets splitted
6) Because it contain seven colours
7) Composite light
8) Violet, Indigo, blue, green, yellow, orange, red
9) Obliquely

CONSOLIDATION

Any light that is composed of more than one colour is a composite light. Dispersion is the phenomenon of splitting of a composite light into its constituent colours. The regular array of colours formed by dispersion is the visible spectrum.

GROUP DISCUSSION-II (10 mts)

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Students examine the chart and find out answers, record in the science diary and present it in the whole group.

Colour	Wavelength (nm)
Violet	400 - 440
Indigo	440 - 460
Blue	460 - 500
Green	500 - 570
Yellow	570 - 590
Orange	590 - 620
Red	620 - 700

DISCUSSION TIPS

1) Which colour has the shortest and longest wavelength ?
2) Which colour deviates most & which is least ?
3) When light passes through the prism, as the wavelength increases, how does the deviation change? Will it increase or decrease ?
4) On the basis of this data, what do you infer
5) How wavelength and dispersion of light are related ?
6) Does dispersion occur only when light passes through a prism ?

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ANSWERS

1) Shortest - violet, longest - red
2) Most - violet, least - red
3) deviation decreases
4) when light passes through prism, it deviates which depends upon the wavelength
5) when wavelength increases, dispersion decreases
6) No

CONSOLIDATION

Light undergoes refraction when it enters the prism obliquely and when it comes out of the prism, the extent of deviation depends on the wavelength. Waves undergo deviation at different angles and get separated.

GROUP ACTIVITY - II

VIDEO OBSERVATION (7 minutes)

Students observe the video presentation regarding the formation of rainbow. Students [redacted]

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discuss and find out answers, record it in the Science diary and present it in the whole group.

Observation tips

- Position of rainbow
- Position of Sun

DISCUSSION TIPS

1) When is the rainbow formed ?
2) Where will be the sun when the rainbow is formed in the East ?
3) Where will be the sun when the rainbow is seen in the west ?
4) What is the reason behind the formation of rainbow ?

ANSWERS

1) After the rain
2) West
3) East
4) Dispersion

CONSOLIDATION

Dispersion of light caused by the water droplets in the atmosphere causes rainbow

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X APPLICATION (3 mts)

Q1. Reason behind the formation of rainbow in the opposite direction of the sun

A. Because sunlight incident on the water droplets (acting as a prism) can be easily refracted and dispersed.

Q2. Can you explain the reason for the formation of different colours in soap bubble ?

A2. Due to dispersion.

XI FOLLOW UP ACTIVITIES

i) Written Assignment

1) what do you understand from the term dispersion ? How rainbow is formed ?

2) when white light passed through the prism, what happens ? Represent pictorially.

ii) Activity Assignment

Take a compact Disk. white light is allowed to fall on a bright side of the CD The reflected light is allowed to fall on a white wall. observe the colours available in the spectrum & write them down in your science diary.

XII REFLECTION NOTES

i) My findings

ii) Follow up activities and remedial measures.

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