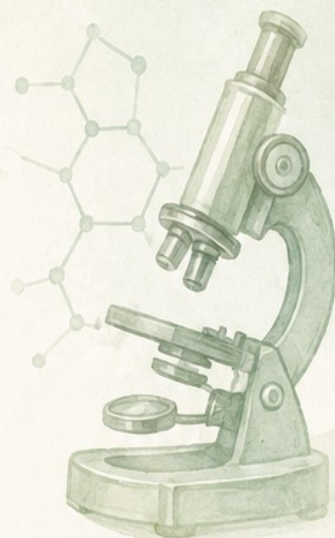




तत त्वे पूषन अपावृणु
केन्द्रीय विद्यालय संगठन



ZONAL INSTITUTE OF EDUCATION AND TRAINING MUMBAI

4 DAY TEACHERS WORKSHOP FOR PGT BIOLOGY

THEME

Transforming Biology Teaching

from content delivery to Competency
development and Assessment

31/08/2026 to 03/09/2026

केन्द्रीय विद्यालय संगठन
आंचलिक शिक्षा एवं प्रशिक्षण संस्थान,
मुम्बई



Kendriya Vidyalaya Sangathan
Zonal Institute of Educational and
Training, Mumbai



Mr. VIKAS GUPTA
COMMISSIONER
KENDRIYA VIDYALAYA SANGATHAN



Ms P.B.S. USHA
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Mr. GAJENDRA L. KAPDE
TRAINING COORDINATOR
ZIET MUMBAI



Dr. MANOJ JAGDALE
RESOURCE PERSON - I
PGT (BIOLOGY), PM SHRI KV No. 2, AFS DEVLALI



Smt. SHEEBA K. M.
RESOURCE PERSON - II
PGT (BIOLOGY), PM SHRI KV No. 2, VASCO, GOA

Programme Overview

The four-day Offline Capacity Building Programme for PGT (Biology) was conducted from 31 August to 03 September 2026 at KVS Zonal Institute of Education & Training (ZIET), Mumbai. The programme theme was “Transforming Biology Teaching from Content Delivery to Competency Development and Assessment.” The programme aimed to strengthen teachers’ conceptual understanding, innovative pedagogical practices, competency-based assessment strategies, integration of digital tools, and ability to connect biological concepts with real-life contexts and meaningful classroom experiences.

The programme brought together academic sessions, interactive discussions, collaborative activities, experiential learning, visualization, digital technology, educational research, classroom-based activities, competency-based assessment and reflective teaching practices. Across the four days, participants were encouraged to move beyond conventional content delivery and focus on conceptual clarity, scientific reasoning, application of biological knowledge, inquiry-based learning, learner engagement, competency development and effective assessment.

The programme also emphasized the integration of ICT and emerging digital tools in Biology teaching, development of competency-based learning experiences, designing meaningful classroom activities, connecting Biology with real-world applications and interdisciplinary perspectives, and using assessment as a tool to monitor and enhance student learning. Through collaborative group work and reflective discussions, teachers were encouraged to develop innovative, learner-centred and outcome-oriented approaches for making Biology teaching more engaging, relevant and effective.

Objectives of the Programme

- Deepen conceptual understanding of important biological concepts, processes and their interrelationships.
- Develop scientific reasoning, critical thinking, inquiry, analytical and problem-solving skills in Biology teaching and learning.
- Strengthen competency-based assessment practices and develop skills for designing application-based, competency-oriented and higher-order questions.
- Promote purposeful integration of ICT, AI and digital resources to enhance Biology teaching, visualization, simulation and learner engagement.
- Encourage learner-centred, activity-based, experiential, inquiry-based and interdisciplinary approaches to Biology teaching.
- Connect biological concepts with real-life situations, current scientific developments and environmental and health-related issues to make learning meaningful and relevant.
- Develop innovative pedagogical strategies for effective classroom transaction, scientific investigation, experimentation and concept visualization.
- Provide opportunities for collaborative professional learning, reflection and sharing of innovative classroom practices among Biology teachers.

Programme Schedule at a Glance

Day & Date	09:00–09:30	09:30–11:00	11:30–13:00	14:00–15:30	16:00–17:30
Day 1- 31 Aug 2026	Registration, Lamp Lighting, Welcome Address, Programme Orientation: Directors Address Coordinator and Team	Diagnostic Quiz Workshop Objectives and Expectation RP-1	NEP-2020 Curricular Goals Competency Based Education, Biology Learning outcomes, CBL Framework Learner, Centred Pedagogy: RP-2	Biomolecules and Enzymes Activity Based Learning, ICT integration, Simulation, Digital Resources, Experiential Learning - RP-2	Preparation of study material RP-1 & RP 2
Day 2 – 01 Sep 2026	Prayer, Report Reading, Thought for the Day, News Reading, Special item. Group -1	Plant Physiology Photosynthesis and Respiration, Experiential activity, Concept Mapping, ICT Animation: RP-1 Art Integrated Learning (RP 2)	“Biology education through animation, simulations and presentation” Dr. Deepesh TGT (Sc.) KV IIT Powai	Application of biology and engineering principles in implant design Dr. Soni In IIT Lecture Hall	Lab Visit Session Prof. Ambarish Kunwar IIT Bombay Biosciences Laboratory
Day 3 – 02 Sep 2026	Prayer, Report Reading, Thought for the Day, News Reading, Special item. Group -2	Recombination and Linkage, DNA Fingerprinting, Meselson and Stahl Experiment RP 1	Molecular and Cell Biology Dr. Mayuri Rege Biology Education Cell HBCSE, TIFR, Mumbai	Genetics and Genomics Dr. Shinde Professor IITB	Biotechnology: Principles and Applications Dr. Shinde Professor IITB
Day 4 – 03 Sep 2026	Prayer, Report Reading, Thought for the Day, News Reading, Special item. Group -3	Ecology, Biodiversity Evolution, Hardy Weinberg Equilibrium, Species –area relationship RP-1	Human Physiology Neural and Chemical coordination- CBL RP 2	Submission of study material and Presentation RP-1 & RP 2	Reflection, Experience Sharing, Feedback, Post-Test & Valedictory Resource Persons, Coordinator & Team in Presence of The Director, ZIET Mumbai Group-4

RESOURCE PERSONS

- 1. DR. MANOJ JAGDALE (PGT, PM SHRI KV2, AFS DEVLALI)**
- 2. Smt. SHEEBA.K.M (PGT, PM SHRI KV2, VASCO, GOA)**

केन्द्रीय विद्यालय संगठन / KENDRIYA VIDYALAYA SANGATHAN,
आंचलिक शिक्षा एवं प्रशिक्षण संस्थान मुंबई / ZONAL INSTITUTE OF EDUCATION AND
TRAINING MUMBAI,
स्नातकोत्तर शिक्षक (जीव विज्ञान) हेतु "Transforming Biology Teaching from content delivery to
Competency development and Assessment"
दिनांक 31.08.2026 से 03.09.2026 (4 दिवसीय मुखाभिमुख कार्यशाला) / Offline Workshop

S NO.	नाम हिन्दी में	M/F	संभाग	केन्द्रीय विद्यालय
1	श्री सुरेन्द्र शर्मा	MALE	अहमदाबाद	पीएम श्री केन्द्रीय विद्यालय अहमदाबाद कैंट
2	श्रीमती चंचल शर्मा	FEMALE	अहमदाबाद	पीएम श्री केन्द्रीय विद्यालय क्र.2 आर्मी वडोदरा
3	श्री गोविन्द सिंह	MALE	अहमदाबाद	पीएम श्री केन्द्रीय विद्यालय क्रं.1 वायुसेना जामनगर
4	सुश्री मुस्कान केजरीवाल	FEMALE	अहमदाबाद	पीएम श्री केन्द्रीय विद्यालय नंबर 2, इन्फैंट्री लाइंस, जामनगर
5	श्रीमती मोनिका जांगिड़	FEMALE	अहमदाबाद	पीएम श्री केन्द्रीय विद्यालय जूनागढ़
6	सुश्री दिशा झा	Female	अहमदाबाद	केन्द्रीय विद्यालय क्रमांक 2, कृभको, सूरत
7	श्रीमती अंजना बुंदेला	Female	अहमदाबाद	केन्द्रीय विद्यालय क्रमांक 3, ओएनजीसी सूरत
8	श्री प्रभु सिंह	MALE	जयपुर	पीएम श्री केन्द्रीय विद्यालय देवगढ़
9	श्रीमती अशोक मीणा	FEMALE	जयपुर	पीएम श्री केन्द्रीय विद्यालय बनाड़
10	श्रीमती सुधा मीना	FEMALE	जयपुर	केन्द्रीय विद्यालय बांदीकुई
11	श्री सुनील गोस्वामी	MALE	जयपुर	पीएम श्री केन्द्रीय विद्यालय नागौर
12	श्री पुनीत	MALE	जयपुर	केन्द्रीय विद्यालय क्र.2, बीकानेर
13	श्रीमती नेहा जैन	FEMALE	जयपुर	पीएम श्री केन्द्रीय विद्यालय बांसवाडा
14	श्री राजेश वर्मा	MALE	जयपुर	केन्द्रीय विद्यालय बान्दरसिंदारी
15	श्री नवरत्न	MALE	जयपुर	पीएम श्री केन्द्रीय विद्यालय आं. सु. अ. (सीआरपीएफ) माउंट आबू
16	श्री हरीश गोयल	MALE	जयपुर	केन्द्रीय विद्यालय एसटीपीएस, सूरतगढ़
17	श्रीमती शिप्रा मिश्रा	Female	मुंबई	केन्द्रीय विद्यालय WCL चंद्रपुर
18	श्री नितिन गणेशराव डोंगरे	Male	मुंबई	केन्द्रीय विद्यालय पुलगांव कैम्प
19	श्रीमती पारुल यादव	Female	मुंबई	पीएम श्री केन्द्रीय विद्यालय तलेगांव
20	श्रीमती अर्चना कुमारी	Female	मुंबई	केन्द्रीय विद्यालय ओ एन जी सी पनवेल

21	श्रीमती विभावरी राजकुमार नागरे	Female	मुंबई	पीएम श्री केंद्रीय विद्यालय कामठी
22	श्री धाकतोडे दगडू विठ्ठल	Male	मुंबई	पीएम श्री केंद्रीय विद्यालय विआरडीई अहमदनगर
23	श्रीमती सुषमा	Female	मुंबई	पीएम श्री केंद्रीय विद्यालय लोनावला
24	श्री सौरभ वर्मा	Male	मुंबई	पीएम श्री केंद्रीय विद्यालय बी एस एफ चाकुर
25	श्री नरेश कुमार सुथार	Male	मुंबई	पीएम श्री केंद्रीय विद्यालय नांदेड
26	श्री राजीव रंजन कुमार	MALE	पटना	केंद्रीय विद्यालय क्र.2,आईओसी बरौनी
27	श्री प्रवीण कुमार	MALE	पटना	केन्द्रीय विद्यालय रे.प.का. बेला
28	श्रीमती अर्चना सुमन	FEMALE	पटना	पीएम श्री केंद्रीय विद्यालय क्र.1, गया जी
29	श्री अरुण भारतीय	MALE	पटना	पीएम श्री केंद्रीय विद्यालय क्र.2, गया जी
30	श्री रमेश कुमार यादव	MALE	पटना	पीएम श्री केंद्रीय विद्यालय सीआरडब्ल्यू हरनौत
31	श्रीमती श्वेता प्रसाद	FEMALE	पटना	केंद्रीय विद्यालय आई. आई. टी. पटना
32	श्रीमती खुशबू रानी	FEMALE	पटना	केन्द्रीय विद्यालय एनपीजीसी नबीनगर
33	श्री राशिद हुसैन	MALE	पटना	पीएम श्री केंद्रीय विद्यालय आरपीसीएयू पूसा
34	श्री विरेन्द्र कुमार मौर्या	MALE	पटना	पीएम श्री केंद्रीय विद्यालय पूर्व मध्य रेल समस्तीपुर
35	श्री मनोज पुषाम	MALE	रायपुर	पीएम श्री केन्द्रीय विद्यालय धमतरी
36	श्रीमती अल्पना भास्कर	FEMALE	रायपुर	पीएम श्री केन्द्रीय विद्यालय डोंगरगढ़
37	श्रीमती कुमारी गुड्डि	FEMALE	रायपुर	केन्द्रीय विद्यालय सीआरपीएफ बिलासपुर
38	श्री भैंरो लाल मीना	MALE	रायपुर	पीएम श्री केन्द्रीय विद्यालय जगदलपुर
39	श्रीमती एस्तर कुमार	FEMALE	रायपुर	केन्द्रीय विद्यालय क्र. 4 कोरबा
40	श्री विनय कुमार	MALE	रायपुर	पीएम श्री केन्द्रीय विद्यालय नारायणपुर
41	श्रीमती भारती ठाकुर	FEMALE	रायपुर	पीएम श्री केन्द्रीय विद्यालय रायगढ़
42	श्री जोगेंद्र प्रधान	MALE	रायपुर	पीएम श्री केन्द्रीय विद्यालय क्र. 1 रायपुर (प्रथम पाली)
43	शरद लाडेश्वर	Male	रायपुर	पीएम श्री केन्द्रीय विद्यालय क्र. 02 रायपुर

DAY 1: 31 August 2026

Four-Day Capacity-Building Workshop for PGT Biology

Inaugural Session

The four-day Capacity-Building Workshop for PGT Biology at ZIET Mumbai commenced with enthusiasm and a strong spirit of professional learning. The workshop aimed to strengthen teachers' pedagogical competencies, enhance competency-based assessment practices and promote innovative approaches to Biology teaching and learning. The participants were formally welcomed and introduced to the dignitaries and resource persons associated with the programme. The inaugural session was graced by Shri T. Prabhudas, Director, ZIET Mumbai, who addressed the participants and shared his valuable insights, expectations and vision for the workshop. Shri. Gajendra Kapde, Training Associate, ZIET Mumbai, coordinated the programme and provided guidance throughout the sessions. The academic sessions were facilitated by Dr. Jagdale, PGT Biology, PM SHRI KV AFS Devlali, and Smt. Sheeba K. M., PGT Biology, PM SHRI KV No. 2 Vasco, Goa. The programme commenced with a prayer and ceremonial lighting of the lamp, symbolising the beginning of a meaningful learning journey. The distribution of reusable bottles further reflected the workshop's emphasis on environmentally responsible practices.



LAMP LIGHTING CEREMONY



LAMP LIGHTING CEREMONY



INAUGURAL SESSION

Session -1 Diagnostic Assessment and Workshop Orientation

Time- 9:30 AM - 11:00 AM

Resource Person – Dr. Manoj Jagdale

The first academic session, conducted by Dr. Jagdale, began with a diagnostic quiz to assess participants' existing understanding and facilitate reflection on their learning needs. This was followed by an interactive discussion on the objectives, expectations and key outcomes of the workshop. The session provided participants with a clear understanding of the academic roadmap and prepared them for the subsequent learning experiences. NEP and NEET based Pre-Test conducted for the participants.



SESSION BY DR MANOJ JAGDALE

Session -2 NEP 2020 and Curricular Goals

Time- 11:30 AM -1:00 PM

Resource Person – Smt. Sheeba K.M.

The second session, facilitated by Smt. Sheeba K. M., focused on NEP 2020 and Curricular Goals. The session explored key dimensions of contemporary education, including competency-based learning, experiential learning, holistic development, critical thinking and the evolving nature of assessment. A practical question-designing activity enabled participants to apply these principles in an authentic educational context. The activity emphasised the importance of designing questions that assess understanding, application and higher-order thinking rather than mere recall.



SESSION: NEP-2020 Curricular Goals, Competency Based Education, Biology Learning outcomes, CBL Framework, Learner Centered Pedagogy

Session - 3 Biomolecules and Enzymes: Experiential Learning

Time=2:00 PM - 3:30 PM

Resource Person – Dr. Manoj Jagdale

The post-lunch session focused on Biomolecules and Enzymes and demonstrated innovative approaches to teaching complex biological concepts. Through games such as Housie, simulations and ICT-based/online tools, participants explored interactive and experiential strategies for classroom instruction. The session highlighted the effective integration of technology and activity-based learning to make abstract biological concepts more accessible and engaging for learners



SESSION: Biomolecules and Enzymes-Activity Based Learning, ICT integration, Simulation, Digital Resources, Experiential Learning

Session - 4 Collaborative Question Designing

Time- 4:00 PM - 5:30 PM

Resource Person – Dr. Manoj Jagdale and Smt. Sheeba K.M.

The final session transformed participants from learners into creative question designers. Working collaboratively, the PGT Biology teachers developed study materials and competency-based, source-based and case-based questions. The activity provided hands-on experience in aligning learning resources and assessment items with contemporary pedagogical approaches. It also encouraged collaboration, creativity and critical thinking among the participants.



DESIGNING OF COMPETENCY BASED QUESTIONS

Conclusion - From Learning to Creation

The first day followed a progressive learning trajectory -from diagnosing existing knowledge and understanding educational objectives to exploring innovative pedagogy and finally creating meaningful assessment resources. The day concluded with an overview of the Day 2 schedule, leaving the PGT Biology teachers motivated and prepared for the next phase of the workshop. The first day successfully established a strong foundation for professional development, innovative Biology pedagogy and competency-based assessment.

Day 1 reflection- The first day moved teachers through a clear progression: diagnosing existing understanding, situating Biology teaching within NEP 2020 and the Curricular Goals, and then exploring Biomolecules and Enzymes through experiential and ICT-based activities. The sessions encouraged participants to move beyond content delivery and focus on competency-based question design, application and higher-order thinking. The collaborative question-designing session at the end of the day also highlighted the importance of translating pedagogical ideas into authentic, classroom-ready assessment resources.

DAY 2: 01 September 2026

Day 2 began on an energetic and positive note with the Morning Assembly presented by the Mumbai Region.



MORNING ASSEMBLY BY THE MUMBAI REGION

Session -1 Experiential and Art Integrated Learning

Time- 9:30 AM - 11:00 AM

Resource Persons – Smt. Sheeba K. M. and Dr. Manoj Jagdale

The first session was conducted by Smt. Sheeba K. M. and focused on Art Integrated Learning, Experiential and Toy-Based Learning related to Biology contents. The session demonstrated several innovative ways of making Biology more engaging, including preparation of food chains using toys and charts, videos on interactions between species, and creative expressions such as poems, dance and role play, including the composition “जीवन की श्रृंखला ” and role play on Transcription and Translation. This was followed by preparation of flip cards by the participants, an activity conducted by Dr. Manoj Jagdale. The session conveyed that when students experience a concept, they do not merely learn it – they live it.



Session -2 ICT, Digital Tools and AI for Foundational Learning Goals

Time- 11:30 AM -1:00 PM

Resource Person – Dr. Deepesh, KV IIT Powai

The second session was conducted by Dr. Deepesh from KV IIT Powai and focused on the purposeful use of ICT, digital tools and Artificial Intelligence for achieving foundational learning goals in Biology. Participants were introduced to tools such as SnapGen AI, Google AI Studio, Suno and Lumi, and explored how these platforms can support content creation, visualisation and learner engagement. The session reinforced the message that technology does not replace the teacher; it empowers the teacher.



SESSION : “Biology education through animation, simulations and presentation”

Dr. Deepesh

TGT (Sc.) KV IIT Powai

Session -3 Application of Biology and Engineering Principles: Oral and Maxillofacial Surgery

Time- 2:00 PM - 3:30 PM

Resource Person – Dr. Vivek Soni, IIT Bombay

The post-lunch session was conducted by Dr. Vivek Soni from IIT Bombay on Oral and Maxillofacial Surgery. The session shared insights into topics such as the Temporomandibular Joint (TMJ) and oral cancer, and highlighted the application of biology and engineering principles in implant design, helping participants understand the connection between fundamental Biology and its clinical and medical applications. Participants were subsequently organised into groups for the next session.



**SESSION: Application of biology and engineering principles in implant design
BY DR VIVEK P SONI AT IITB**

Session -4 Lab Visit: Department of Biosciences and Bioengineering, IIT Bombay

Time- 4:00 PM - 5:30 PM

Resource Person – Prof. Ambarish Kunwar, IIT Bombay

The day concluded with an enriching visit to the Department of Biosciences and Bioengineering at IIT Bombay under the guidance of Prof. Ambarish Kunwar. The visit provided participants with valuable exposure to the research environment, laboratory facilities and the practical application of biological sciences in advanced research.



LAB VISIT – DEPARTMENT OF BIOSCIENCES AND BIOENGINEERING, IIT BOMBAY



GUIDANCE BY PROF. AMBARISH KUNWAR

Day 2 reflection- Day 2 was truly a journey from experiential learning and creative pedagogy to digital innovation, medical applications and advanced biological research. The sessions reinforced that Biology teaching becomes most effective when abstract concepts are connected with real-life experience, technology and interdisciplinary application.

DAY 3: 02 September 2026

Day 3 of the workshop was a highly productive day, packed with intensive training, academic insight and engaging activities centred around Genetics, Molecular Biology and Modern Biotechnology. The day commenced with a refreshing morning assembly presented by the Ahmedabad Region, followed by administrative guidance and benchmark-setting by the Course Director.

Session -1 Linkage, Recombination and Gene Mapping

Time- 9:30 AM - 11:00 AM

Resource Person – Dr. Manoj Jagdale

The technical sessions began with Dr. Manoj Jagdale, who took participants through a deep dive into advanced genetics. He explained T. H. Morgan's landmark experiments on the chromosomal theory of inheritance and the intricacies of Linkage and Recombination, and demonstrated practical methods for Gene Mapping using localised recombination frequencies – a concept of direct relevance to classroom teaching.



SESSION: Recombination and Linkage, DNA Fingerprinting, Meselson and Stahl Experiment

Session -2 Molecular Medicine and Cell Biology

Time- 11:30 AM -1:00 PM

Resource Person – Dr. Mayuri Rege, Professor, HBCSE, TIFR Mumbai

The mid-day session was led by Guest Speaker Dr. Mayuri Rege on cutting-edge molecular medicine. She presented a high-impact case study on CRISPR technology, focusing on the profound scientific and ethical dimensions of editing human embryos and modifying target DNA sequences. She explained about the central dogma of molecular biology and how to crack the code.



SESSION: Molecular and Cell Biology

Dr. Mayuri Rege

Biology Education Cell

HBCSE, TIFR, Mumbai

Session -3 Genetics and Genomics

Time- 2:00 PM - 3:30 PM

Resource Person – Prof. Dr. Shinde, IIT Bombay

The post-lunch session was conducted by Prof. Dr. Shinde, who demonstrated how modern pedagogical techniques can be integrated into complex scientific topics. Participants took part in an interactive game titled “Two Truths and a Genetic Myth” and a collaborative Jigsaw group activity analysing real-world media clippings on “Genomics in the News.” Through these exercises, Dr. Shinde covered critical curriculum pillars including Bioinformatics, milestones of the Human Genome Project, and the complete laboratory workflow of DNA Fingerprinting.



SESSION: Genetics and Genomics

Dr. Shinde

Professor IITB

Session -4 Biotechnology: Principles and Applications

Time- 4:00 PM - 5:30 PM

Resource Person – Prof. Dr. Shinde, IIT Bombay

To conclude an intense day, Dr. Shinde delivered a masterclass on the “Toolkit of Modern Biotechnology,” providing participants with tactical, curriculum-aligned strategies to simplify complex genetic vectors and bioprocess applications for senior secondary students. Day 3 successfully bridged the gap between complex molecular theory and practical, activity-based classroom teaching.



SESSION: Biotechnology: Principles and Applications

Dr. Shinde

Professor IITB

Day 3 reflection- Day 3 brought together genetics, molecular medicine and modern biotechnology through expert-led sessions and interactive, activity-based learning. The day reinforced the value of connecting curriculum content with contemporary scientific developments and hands-on pedagogical strategies, and concluded with sincere appreciation to the Course Director, coordinators and resource persons for an enriching experience.

DAY 4: 03 September 2026

The fourth day of the workshop at ZIET Mumbai focused on the integration of Artificial Intelligence, competency-based teaching, innovative pedagogical approaches, collaborative learning, and assessment practices in Biology education. The sessions were highly interactive and provided practical exposure to various tools and strategies that can be incorporated into classroom teaching.

Session -1 Morning Online Session: AI Literacy Baseline Survey

Time- 8:30 AM - 10:00 AM

Resource Person – Dr. Raj Kumar Rajendra, Centre for Educational Technology, IIT Bombay

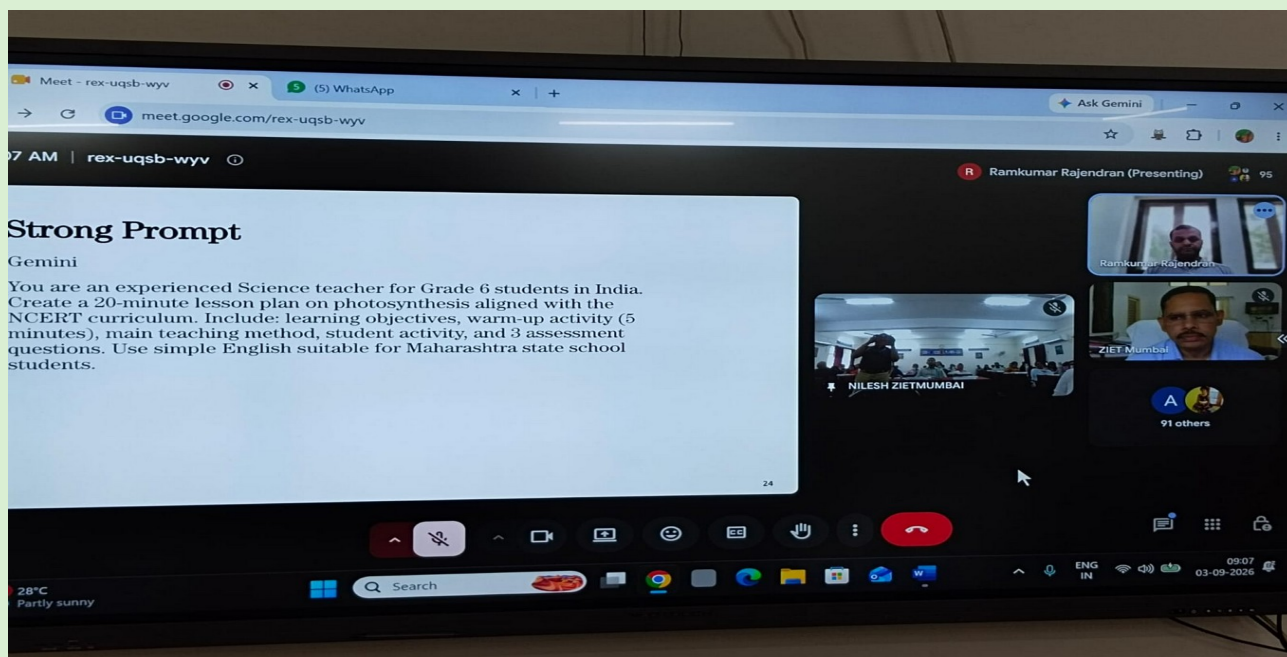
The day began with an online session from 8:30 a.m. to 10:00 a.m. conducted by Dr. Raj Kumar Rajendra from the Centre for Educational Technology, IIT Bombay. The session focused on AI tools and developing an understanding of the emerging role of Artificial Intelligence in education.

During the session, various AI tools such as NotebookLM, Gemini and Cloud AI were discussed. The participants explored how these tools can support teachers in lesson planning, content development, resource creation, information organisation and enhancing classroom learning experiences.



AI LITERACY SESSION BY DR. RAJ KUMAR RAJENDRA

A significant part of the session was devoted to prompting. Dr. Raj Kumar explained the importance of writing effective prompts while interacting with AI tools. The participants discussed what constitutes a good prompt and explored different approaches for improving prompts to obtain relevant, accurate and meaningful responses from AI.



PARTICIPANTS EXPLORING EFFECTIVE PROMPTING

The session highlighted that AI should be used not merely for content generation but as a tool to support critical thinking, creativity, competency development and effective teaching-learning practices.

Session -2 Morning Assembly

Following the online session, the participants attended the morning assembly, which provided an opportunity for reflection, discipline and collective participation before proceeding with the academic sessions of the day.

Session -3

Competency Based Learning

The Activity based Demo sessions were conducted by participants of Mumbai Region, Ahmedabad Region, Raipur Region, Patna Region and Jaipur Region. The Demo lesson presentation by Ms. Archana Kumari from KV ONGC PANVEL on topic Hardy-Weinberg Principle was appreciable. She introduced the participants to the HARDY-WEINBERG Principle and discussed its relevance in the teaching-learning process.

The session encouraged teachers to look beyond conventional content delivery and focus on approaches that promote better understanding, learner engagement and development of competencies among students. The concept was connected with classroom practices and encouraged participants to reflect on how innovative strategies can make Biology teaching more effective.

Group discussion has been conducted in which the participants were deeply involved in the discussion of difficult topics from Biodiversity and conservation, Human Physiology and Animal physiology. Discussions involved regarding the various pedagogies that can use to concept clarity.



Session -4 Group Activity and Presentation and Online Video Content Creation

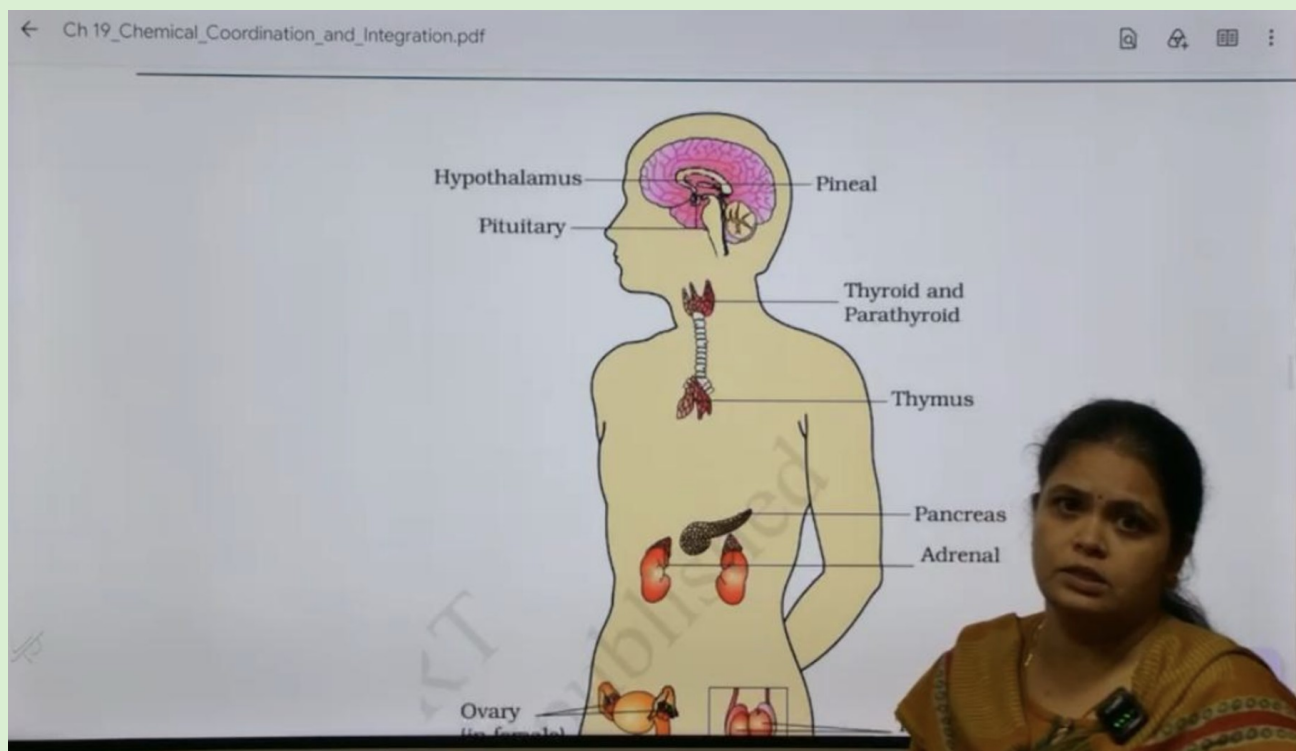
An engaging group activity was subsequently conducted in which participants worked collaboratively on the creation of online video content.

Participants were divided into groups representing different regions, including Mumbai Region, Ahmedabad Region, Raipur Region, Patna Region and Jaipur Region.

Each group selected a suitable Biology topic and planned and presented it as an online video-learning resource. The activity provided hands-on experience in converting Biology concepts into engaging digital content.



Group Presentation : Activity Based pedagogies for difficult topics



VIDEO RECORDING SESSION AT ZIET MUMBAI

The group presentations demonstrated different approaches to explaining concepts through visualization, narration, activities and technology-based resources. The activity also promoted teamwork, creativity, communication skills, digital literacy and collaborative problem-solving. The participants were trained to create Video content in AV room. Participants tried to create the teaching/content videos after receiving the training.

Disclosure of Pre-Test Answer Sheets

Following the lunch break, the participants were shown the answer sheets of the pre-test. This provided an opportunity to review their responses, identify errors and reflect upon their existing level of understanding.

The activity helped participants recognise their learning gaps and provided a basis for comparing their progress during the subsequent post-test.

Post-Test Session

A post-test was conducted to assess the learning and understanding gained during the workshop. The post-test served as an important component of the assessment process and helped participants evaluate the extent to which the concepts and competencies addressed during the workshop had been acquired.

The comparison between the pre-test and post-test also highlighted the importance of assessment as a tool for learning and improvement, rather than merely as a means of assigning marks.

Collaborative Group Work and Academic Responsibility

The workshop also assigned collaborative academic work to participants.

SL.NO	PARTICIPANTIN G REGION	ASSIGNED UNITS OF CLASS XI AND XII BIOLOGY	ASSIGNED GROUP WORK	ASSIGNED INDIVIDUAL WORK
1	MUMBAI	CLASS XI - UNIT I (Diversity of Living Organisms) & CLASS XII UNIT VII (Genetics and Evolution)	1. Chapter-wise Competency based practice paper of 40 marks each.	Model Question Paper for Class XI SEE with MS and Blueprint.
2	AHMEDABAD	CLASS XI - UNIT II (Structural Organization in Plants and Animals) & CLASS XII UNIT VIII (Biology and Human Welfare)	2. 50 Competency based MCQs covering all the chapters in the assigned units (NEET/CBSE Standard). 3. 25 AR Questions. 4. Unit-wise Case-based/Source based worksheet.	Model Question Paper for Class XI SEE with MS and Blueprint. Report Compilation: Smt. Chanchal Sharma, PGT Biology, PMSHRI KV No 2 Army Vadodara
3	JAIPUR	CLASS XI - UNIT III (Cell: Structure and function) & CLASS XII UNIT IX (Biotechnology and its Applications)	5. Any other task assigned at the Venue	Model Question Paper for Class XII with MS and Blueprint.
4	RAIPUR	CLASS XI - UNIT IV (Plant Physiology) & CLASS XII UNIT X (Ecology and Environment)		Model Question Paper for Class XII with MS and Blueprint.
5	PATNA	CLASS XI - UNIT V (Human Physiology) & CLASS XII UNIT VI (Reproduction)		Model Question Paper for Class XI HY Exam with MS and Blueprint.

Impression on Transforming Biology teaching from content delivery to Competency Development and Assessment

By: Vinay Kumar, PGT (Bio), PM SHRI KV Narayanpur, Raipur Region

Respected Director, distinguished resource persons, course coordinator, and my fellow masters of the biological universe,

Greetings of the day.

Standing here today on behalf of all the participants, I feel a deep sense of gratitude—and perhaps a slight spike in my adrenaline—as I share our collective impression of this In-Service Training Programme at ZIET Mumbai.

When we first received our movement orders, I think many of us anticipated a quiet week of passive listening, drinking endless cups of tea, and nodding along to PowerPoint slides. But ZIET Mumbai clearly had a different hypothesis in mind. Instead of a passive environment, we were thrown right into an active, highly stimulated ecosystem of ideas.

As Biology teachers, we spend our lives explaining cellular respiration, genetic drift, and ecosystem dynamics. But this workshop reminded us of what it feels like to be on the receiving end of a high-yield learning process.

- **Lab & Tech Upgrades:** From dissecting complex competency-based questions to integrating modern digital tools and ICT simulations, we were reminded that teaching biology in the 2020s requires much more than just a piece of chalk and a diagram of the human heart.
- **NEP Alignment:** We dissected the NCF and NEP framework with the same precision we usually reserve for a flower or an *Amoeba*, ensuring our lesson plans are as evolved as our curriculum.
- **Survival of the Fittest:** Watching fellow PGTs debate the finest nuances of genetics at 9:00 AM sharp proved that the instinct for academic survival is alive and well in Kendriya Vidyalaya.

Beyond the formal curriculum, the best part of this workshop was the horizontal gene transfer of ideas between participants. Exchanging practical tricks, low-cost teaching models, and shared classroom struggles with colleagues from across different Kendriya Vidyalayas was genuinely invigorating.

We extend our heartiest thanks to the Director and team at ZIET Mumbai for their warm hospitality and flawless organization—and especially for keeping our mitochondria fully supplied with ATP through excellent meals and timely tea breaks. A special thank you to our resource persons for their patience, expertise, and for proving that learning never reaches dynamic equilibrium.

We return to our respective KVs with recharged cellular batteries, upgraded toolkits, and a promise to make biology the most exciting period of our students' day.

Thank you. Jai Hind.

Impressions on 4 day Workshop on Transforming Biology teaching from content delivery to Competency Development and Assessment

By: Praveen Kumar, PGT (Bio), Kendriya Vidyalaya RWP Bela Saran, Patna Region

परम श्रद्धेय पाठ्यक्रम निदेशक महोदय, समादरणीय पाठ्यक्रम समन्वयक महोदय, आदरणीय विषय विशेषज्ञ महोदय/महोदया एवं पांच अलग-अलग क्षेत्रीय कार्यालयों के विभिन्न केंद्रीय विद्यालयों से इस कार्यशाला में आए हुए हमारे सम्मानित साथी, It's a great privilege for us to attend this type of training programme particularly in a venue like ZIET Mumbai, where people love to visit. As we know that, we are passing through a Transforming Era, and things are changing very fast after implementation of NEP 2020. Our education system is changing from rote learning to Competency Based learning, traditional method of teaching to modern method of teaching. Being a student of Biology, we all know that if we do not adapt ourselves with the changing world, our survival in the system will have a great threat. Under such circumstances, it is obvious for a person like me who started his journey in KVS without knowing A-B-C of computer to travel far till now in the world of Artificial Intelligence. We are supposed to acquaint and enrich ourselves with new tools and techniques which will help us in our day-to-day classroom activities and become at par with the society. At this juncture, we gather here not only to impart or gain knowledge but also to build a healthy relationship with one another which will help to clear our doubts and sharing the resources in future too, what we have.

Besides, Biology teaching and learning of different tools, we also get benefitted by using our resources in another field of the KVS flagship programmes like EBSB (Ek Bharat Shreshtha Bharat), where we are assigned a pair state like North-Eastern State or any other region of our Country and to know about the culture and traditions of that place, we need help of someone who belongs to that place. I have availed this opportunity with the help of my friend, Sh.Surendra Sharma ji, PGT Biology who was earlier posted in K V Aizwal (Mizoram) and at present serving at PM SHRI Kendriya Vidyalaya Ahmedabad Cantt. who helped a lot during this programme. Thank you so much sir, for your kind support.

I would like to express my heartfelt gratitude to Kendriya Vidyalaya Sangathan for providing me this opportunity to attend this training programme. I extend my thanks to our Hon'ble Course Director Sir, who constantly spared his valuable time and provided all possible opportunities to make our learning informative and joyful. I also thank Dr.Vivek P Soni, Dr.Ambrish Kunwar, Dr. Shinde, Dr. Mayuri Rege and other faculty and research scholars of IIT Mumbai and Dr. Deepesh from KV IIT Powai, who spared their valuable time and shared their work with us in a very polite and decent manner. I thank Sh. G L Kapde, Trainee Associate of KVS ZIET Mumbai and Course Coordinator, for his encouragement and support during this programme. I also thank entire team of ZIET Mumbai for their support and making this programme a grand success.

अंत में आप सभी का हृदय से धन्यवाद, जय हिन्द... जय
भारत ।

Valedictory Session

The day concluded with the Valedictory Session, marking the culmination of the workshop activities. The session provided an opportunity to reflect upon the learning experiences, key takeaways and competencies developed during the workshop. The participants shared their experiences and reflected on how the knowledge and skills acquired could be effectively incorporated into their Biology classrooms.



The valedictory session brought the day's activities to a meaningful conclusion and reinforced the importance of continuous professional development, innovative teaching practices and competency-based learning.

VALEDICTORY REPORT

A teacher training programme on “Transforming Biology Teaching from Content Delivery to Competency Development and Assessment” was organised at ZIET Mumbai from 31 August to 3 September 2026. The programme focused on competency-based learning, art-integrated learning, experiential learning, activity-based learning and the play-way method of learning, and the valedictory function concluded with great enthusiasm.

On the day of the valedictory function, the Director of ZIET, the Course Coordinator and the respected resource persons were formally welcomed on behalf of all participants. Participants from the five regions – Patna, Raipur, Jaipur, Ahmedabad and Mumbai – shared their positive impressions of the four-day workshop, spoke about what they had learnt, and promised to carry their learning forward to the classroom for the benefit of their students.

A short cultural presentation was given by participant Nitin Dongre, followed by a performance from resource person Shri Manoj Jagdale, and the atmosphere remained enthusiastic and emotional throughout. The Course Coordinator, Shri Gajendra Kapde, addressed the participants and motivated them greatly. The Director, Shri T. Prabhudas, then inspired everyone with his encouraging words and served as the guiding force for the four-day workshop on competency-based assessment and development.

The resource persons, Shri Manoj Jagdale and Smt. Sheeba K. M., trained participants extensively in art-integrated learning and other methods of activity-based and experiential learning for the benefit of students in the classroom. The valedictory programme was enthusiastically organised by the participants of the Patna region, with nine participants from each region taking part with devotion and enjoyment.



Overall Learning and Key Takeaways

- **Competency development was placed at the centre of Biology teaching**, shifting the focus from mere content delivery and memorisation towards application, reasoning, analysis, interpretation and problem-solving.
- **Conceptual understanding was consistently emphasized over rote learning**, encouraging teachers to help students understand biological processes, establish interconnections and apply concepts in unfamiliar situations.
- **Competency-based assessment and question design** were explored extensively, with emphasis on developing questions that assess higher-order thinking, application, analysis, interpretation, critical thinking and scientific reasoning.
- **NEP 2020 and NCF perspectives** were connected with classroom Biology, highlighting the need for experiential, inquiry-based, multidisciplinary and learner-centred approaches.
- **ICT, AI and digital tools** were explored as purposeful resources for Biology teaching, enabling teachers to create interactive learning experiences, visualisations, simulations, presentations, assessments and other engaging digital resources.
- **Visualisation and activity-based learning** were reinforced as powerful strategies for explaining abstract and complex biological concepts such as molecular processes, genetics, physiology and cellular mechanisms.
- **Student misconceptions and learning difficulties** were given particular attention, encouraging teachers to identify conceptual gaps and use appropriate questioning, activities and formative assessment strategies to address them.
- **Collaborative learning among teachers** provided opportunities to exchange classroom experiences, innovative teaching practices, low-cost teaching-learning materials, assessment strategies and technology-enabled resources.
- **Practical and experiential approaches** highlighted the importance of connecting Biology concepts with real-life situations, laboratory experiences, environmental issues and students' everyday observations.
- The workshop encouraged teachers to view **assessment not merely as an evaluation tool but as an integral part of the teaching-learning process**, using formative assessment to continuously monitor and improve student learning.
- The programme promoted **reflective professional development**, motivating teachers to critically examine their existing classroom practices and translate workshop learning into meaningful changes in their respective schools.



Conclusion

The four-day workshop on **“Transforming Biology Teaching from Content Delivery to Competency Development and Assessment”** provided a stimulating and enriching professional learning experience for Biology teachers. The workshop successfully shifted the perspective of teaching from simply completing the syllabus towards **developing scientific competencies, conceptual understanding, critical thinking, inquiry, application and problem-solving abilities among learners.**

The sessions provided valuable insights into **competency-based pedagogy, assessment and question design, NEP 2020 and NCF perspectives, experiential learning, ICT integration, AI-enabled teaching resources and innovative classroom practices.** The combination of expert interactions, collaborative activities, digital tools, practical examples and assessment exercises helped participants connect theoretical understanding with actual classroom requirements.

The workshop also reinforced the idea that a Biology classroom should not be restricted to textbooks, diagrams and information transfer. Instead, it should become a **dynamic learning environment where students observe, question, investigate, analyse, interpret, communicate and apply biological knowledge to real-life situations.**

The exchange of ideas among participating teachers added another valuable dimension to the programme. Sharing experiences, challenges, innovative practices and classroom strategies demonstrated that professional learning becomes more meaningful when teachers learn **with and from one another.**

The workshop concluded with reflection, feedback and opportunities to consolidate the learning gained during the four days. Participants returned to their respective Kendriya Vidyalayas with **recharged**

professional enthusiasm, enriched pedagogical knowledge and an upgraded toolkit of competency-based teaching and assessment strategies.

Ultimately, the workshop served as a reminder that the transformation of Biology teaching begins when we move **from “What should I teach?” to “What should my students be able to understand, apply, analyse and create?”** This shift can make Biology learning more meaningful, engaging, inquiry-driven and relevant to the needs of 21st-century learners.

The workshop was not merely a training programme—it was a step towards transforming the Biology classroom from a place of content transmission into a space of curiosity, competency and scientific thinking.

*"Biology gives you a brain, Life turns it into a mind.": **Jeffrey Eugenides***

*"Biology is the science. Evolution is the concept that makes biology unique.": **Jared Diamond***

— End of Report —

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