शिक्षा मंत्रालय
MINISTRY OF EDUCATION

Virtual lab
as a teaching learning tool for Biology

VIRTUAL LABS

Date and Time

3 December, 2024

from 10:00 AM to 11:00 AM, Tuesday

Resource Persons

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Virtual Lab as a teaching learning tool for Biology

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CIET, NCERT

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Biology Laboratory Learning Environment

Testing theory and Concepts:

- Facilitates experimentation and exploration

Development of Scientific Temper:

- Encourages critical thinking and inquiry

Lab Skill Acquisition:

- Hands-on experience with techniques and methodologies

Virtual Labs: Revolutionizing the Learning Experience

Virtual labs are transforming education by providing immersive, interactive learning experiences that engage students and deepen their understanding of complex topics.

Need of Virtual labs for teaching-learning Biology

User friendly interface

Personalised learning

Accessibility

Cost effective

Equity & Inclusivity

Virtual labs enhance science process skills

- Observation
- Recording data
- Controlling variables
- Data analysis
- Interpretation
- Inference
- Connect experiment to theory (application of theory)

Virtual labs facilitate physical labs

Pre-lab session

Provides Introduction to the following:

- lab activity
- Materials required
- Procedure

Performance session

- Perform the procedure
- Make observations
- Record data

Post-lab session

- Analyze the recorded data
- Interprets and draw conclusions
- Compare their result with theoretical expectations

Pedagogical Use: Aligning Virtual Labs with Learning Objectives

Identify Objectives

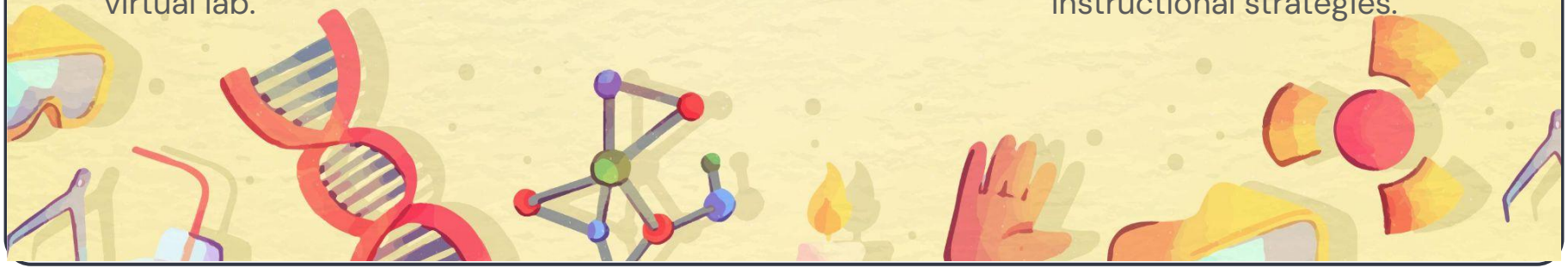
Start by clearly defining the learning objectives and outcomes to achieve through the virtual lab.

Select Appropriate Labs

Choose virtual labs that directly align with learning objectives and complement curriculum.

Integrate in lesson plans

Incorporate virtual labs into lesson plans, ensuring they enhance and support instructional strategies.



Virtual labs as a Diagnostic Assessment tool

A diagnostic assessment is a form of pre-assessment or a pre-test where teachers can assess students' strengths, weaknesses, knowledge and skills before their instruction.

Teachers can demonstrate an experiment on Virtual labs before beginning a topic to identify knowledge gaps and adjust instructions accordingly ensuring students receive the targeted help they need.

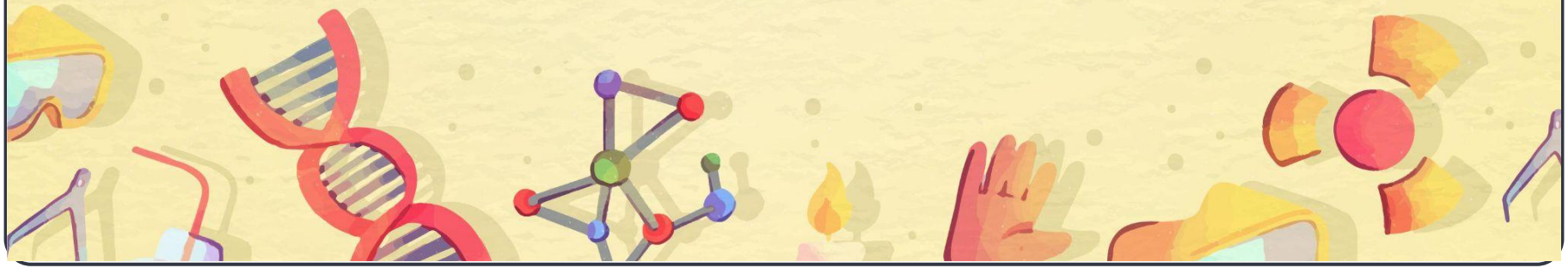
Formative Assessment: Real-Time Feedback

Interactive Simulations

It offers hands-on, interactive simulations that provide real-time feedback to students as they learn.

Collaborative Opportunities

It enables peer collaboration, allowing them to learn from each other in real-time.



Benefits for Learners

Accelerated Learning

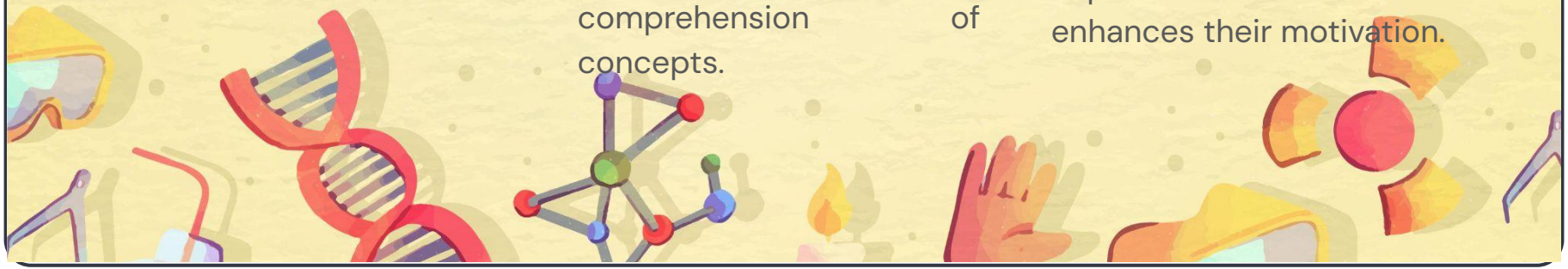
It allows learners to progress at their own pace.

Conceptual Understanding

Hands-on experimentation and immediate feedback help learners to develop a more profound comprehension of concepts.

Enhanced Engagement

It creates an immersive, interactive learning environment that captivates learners and enhances their motivation.



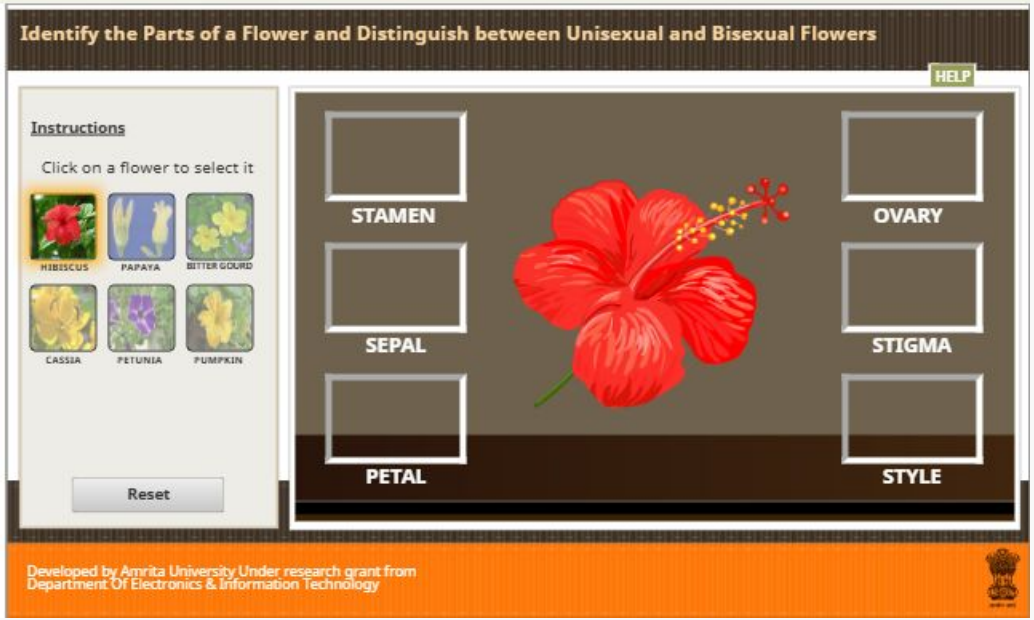
Demonstration of Experiments

Action of Salivary Amylase on Starch

Class XI

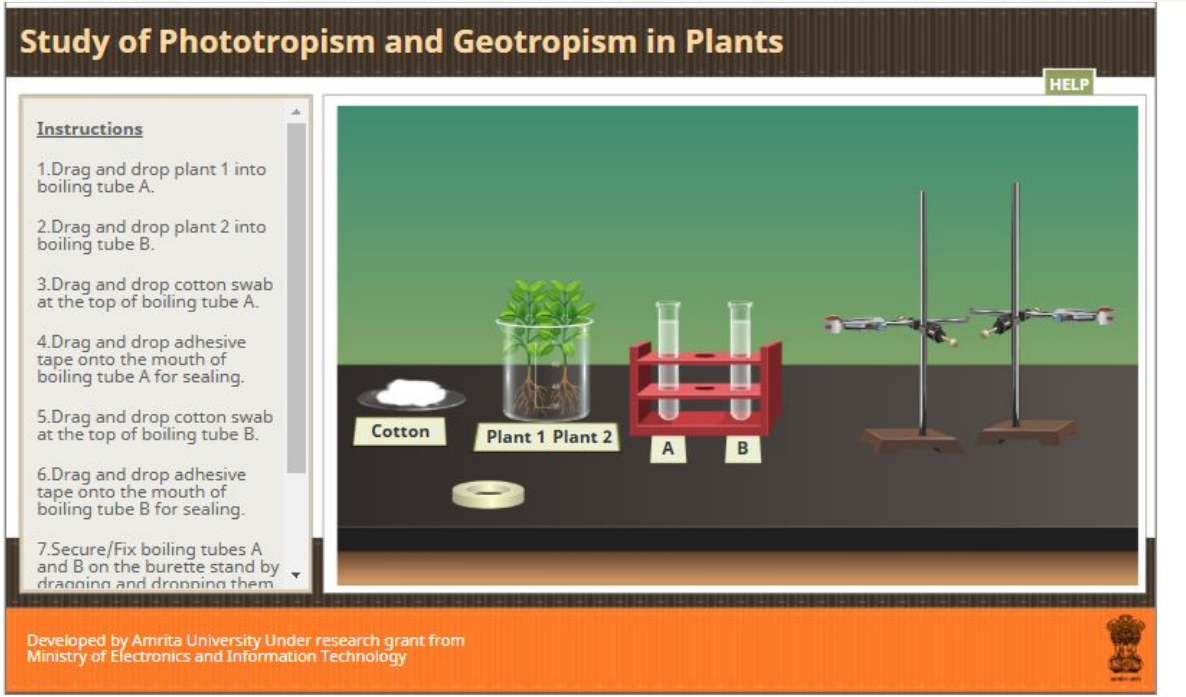
[Simulation Link]

Parts of a flower (Distinguish between Unisexual and Bisexual flower)



simulation link
Class VII

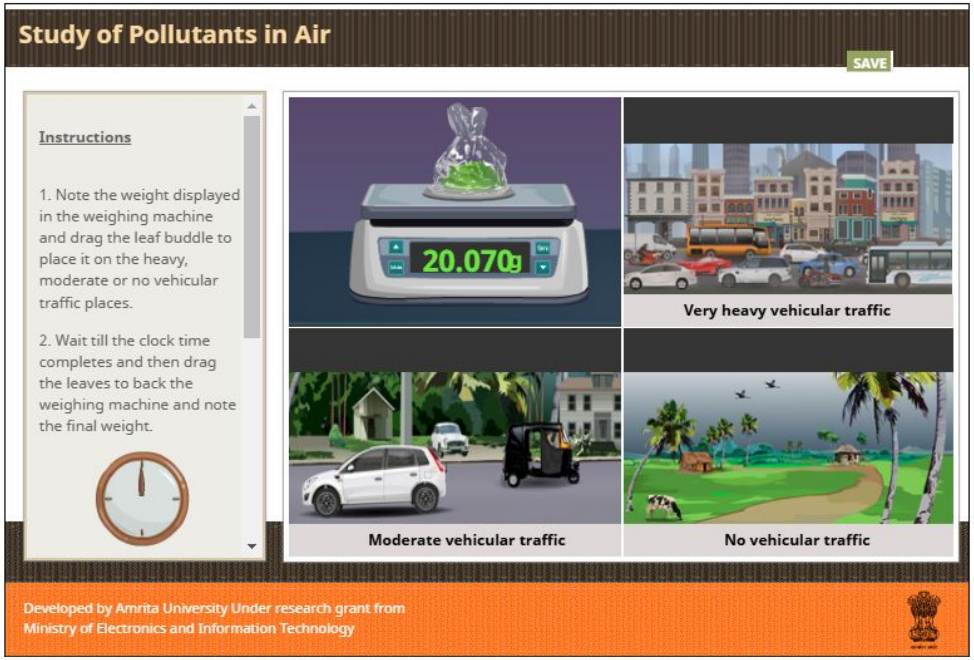
Study of phototropism and geotropism in plants



Class X

[Simulation link]

Study of Pollutants in Air



simulation link
Class XII

Thank You!