




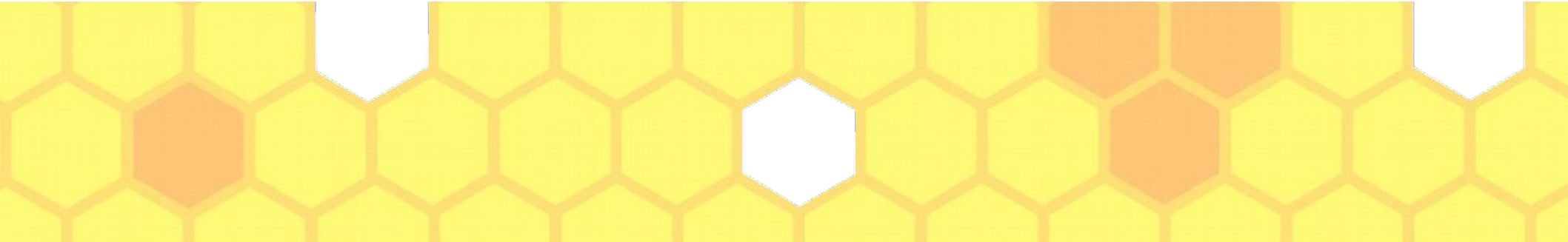
Creating Resources for Science Teaching



Objectives

- To help Teacher Educators understand the role of technology in overcoming the challenges of Science Education
- To enhance Teacher Educators' understanding about the integration of digital tools in teaching -learning of Science



- 
- Science is both a body of knowledge and a process.
 - Science is exciting
 - Science is useful.
 - Science is ongoing
 - Science is a global human endeavor
- 

Curricular expectations of Science Teaching

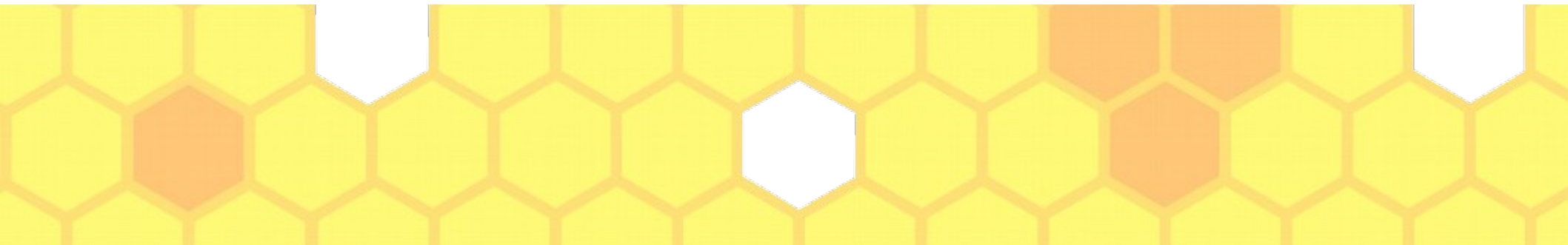
- **Be engaged with hands** to design simple experiments
Intended to develop
- **Scientific temper and scientific thinking**
- **Process skills:** Observation, posing question, searching various resources of learning, planning investigations, hypothesis formulation and testing, Collecting, analyzing and interpreting data, Critically thinking, reflecting on their own thinking
- **Increasing student participation, engagement and retention**

What are the challenges of Science teaching

- Lack of teachers
- Lack of time for teachers
- Lack of time within the classroom period
- Lack of availability of lab assistants
- Content specific problems
- Infrastructural problems
- Problems with science teaching
- Classroom problems
- Psychological problems



Open Educational Resources; Interactive Simulations



PhET Interactive Simulations

- PhET Interactive Simulations are Open Educational Resource(OER) project to provide the free interactive simulations
- To improve the ways of science learning
- To advance Science and Math leducation world wide through free interactive simulations
- Free Science and Math simulations for Teaching STEM topics, including Physics, Chemistry, Biology and Math from University of Colorado Boulder.



<https://phet.colorado.edu/>



Online Labs for School Lab Experiments-

Interactive simulations

- ✓ Content aligned to NCERT/CBSE and State Board Syllabus.
- ✓ Physics, Chemistry, Biology Labs from Class 9 to Class 12. English and Maths lessons for Class 9 and 10.
- ✓ Interactive simulations, animations and lab videos.
- ✓ The concepts and understanding of the experiment.
- ✓ The ability to perform, record and learn experiments - anywhere, anytime, and individualised practice in all areas of experimentation.



<https://www.olabs.edu.in/>

Avogadro

Molecule Editor Software

- Free and Open Source Software
- Construct, edit and view molecules in 3D
- 3D molecular Editor and Visualization tool; Huge fragment library to load inbuilt structures
- Freely downloaded on Mac, Windows and Linux OS



<http://avogadro.cc>



Stellarium

Astromomy software

- Free and Open Source Planetarium
- Shows a realistic sky in 3D, Just like what you see with the naked eye, binoculars or a telescope
- Available for Linux, Windows and macOS.



<http://stellarium.org/>



Kalzium

- Application software for exploration of elements and properties, their classification
- Based on the periodic table of elements
- OER downloaded freely in Ubuntu

RSC periodic table:

- Interactive periodic table
- Features history, alchemy, podcasts, videos and data trends across the periodic table
- Detailed elements of information



<https://www.rsc.org/periodic-table/>



Biology Simulations

- Biology Simulations LLC is a website that helps students learn about biology and practice data analysis skills.
- The simulations all have random components, so there will likely be some variation to quantitative results each time the activities are run. In addition, many are designed to be used for inquiry opportunities.
- This site and the simulations are designed by Jolene Pappas, a high school biology teacher at Batavia High School in Batavia, OH.



<https://www.biologysimulations.com/>



Anatomy 4D

- x 4D Interactive Anatomy puts you in control of navigating and learning from real photographic anatomy on any screen.
- x Intricate structural detail of a given specimen that experiences dissection the way it really happens. This means no artistic interpretations intentional or otherwise of an artist, illustrator or 3D computer modeler.



<https://www.4danatomy.com/modules>



References

- <https://undsci.berkeley.edu/understanding-science-101/what-is-science/science-for-all/>
- https://emjpru.in/Files/1455_62362IssuesandChallengesinScienceEducationinIndia.pdf
- <https://www.youtube.com/watch?v=U9gjbs6gwY8>

- 
- <https://undsci.berkeley.edu/understanding-science-101/what-is-science/science-for-all/>

References

- https://emjpru.in/Files/1455_62362IssuesandChallengesinScienceEducationinIndia.pdf
 - <https://www.youtube.com/watch?v=U9gjbs6gwY8>
- 