



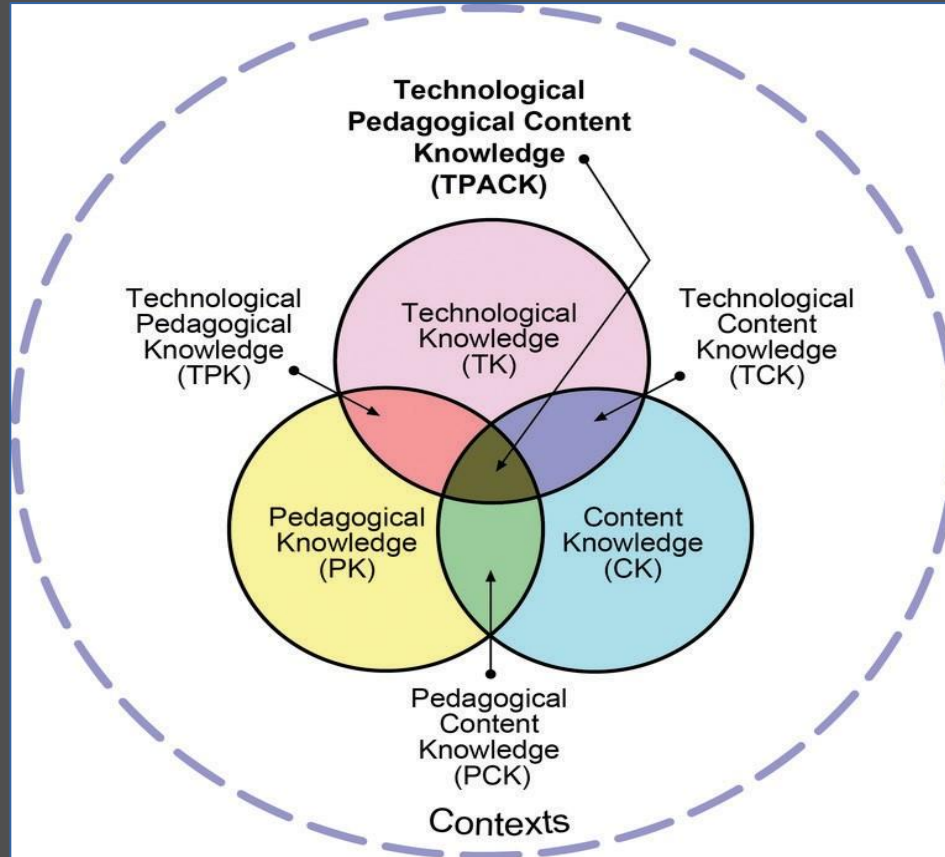
Exploring ICT Resources for Learning of Science: Development & Demonstration

Curricular Expectations for Science education?

- Be **engaged** in working 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
 - ✓ Increase **student participation, engagement, retention**

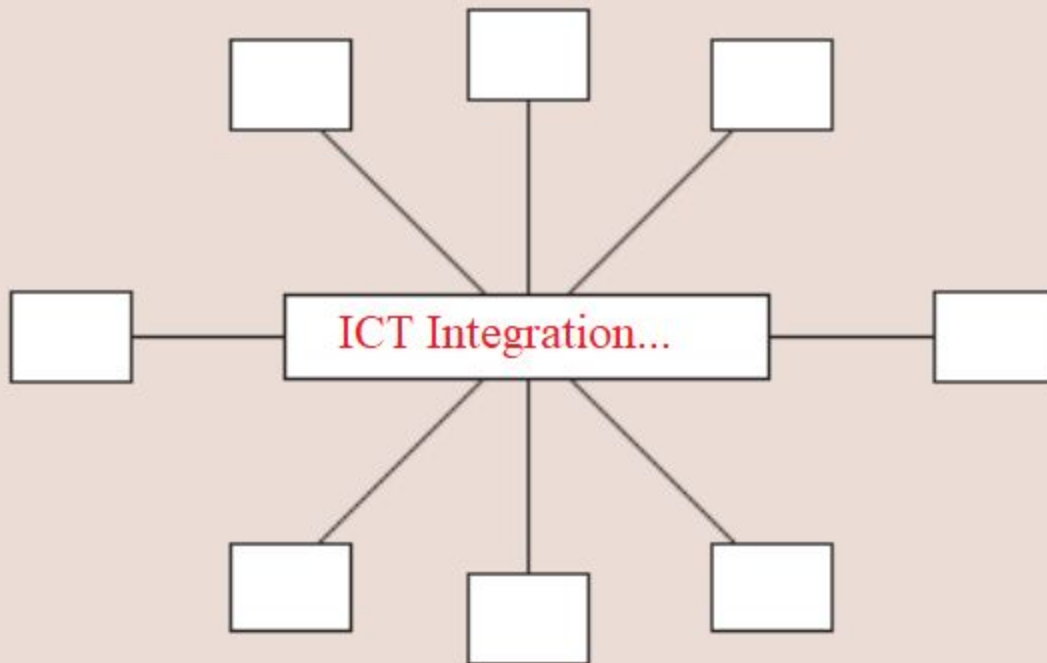


How to Integrate ICT in Teaching-learning?



Understanding the concept of ICT Integration?

Share your ideas in the chat box on 'ICT Integration...'



Let us present your responses creating a mind map using free plane

Mind Map

- A graphical way to represent ideas and concepts
- Visual thinking tool that helps structuring information, better analyze, comprehend, synthesize, recall and generate new ideas
- Mind mapping Free and Open Educational software: **Free Mind** and **Free Plane** (windows/ mac/ ubuntu)
- Android app: **Mindly** and **SimplyMind Lite**

ICT; Technology/ Tools/ e Content

Criteria For Media Selection and Integration

- Availability
- Accessibility
- Reliability and Validity
- Economy/Costing

Broad categories of eContents

Text Image Audio Video Interactive Animation Simulation

```
graph TD; A[Broad categories of eContents] --- B[Text]; A --- C[Image]; A --- D[Audio]; A --- E[Video]; A --- F[Interactive]; A --- G[Animation]; A --- H[Simulation];
```

Where to get e-Content?

Resources???

Open Educational Resources; Interactive simulations

PhET Interactive Simulations: Open educational resource (OER) project for provide the free interactive simulations

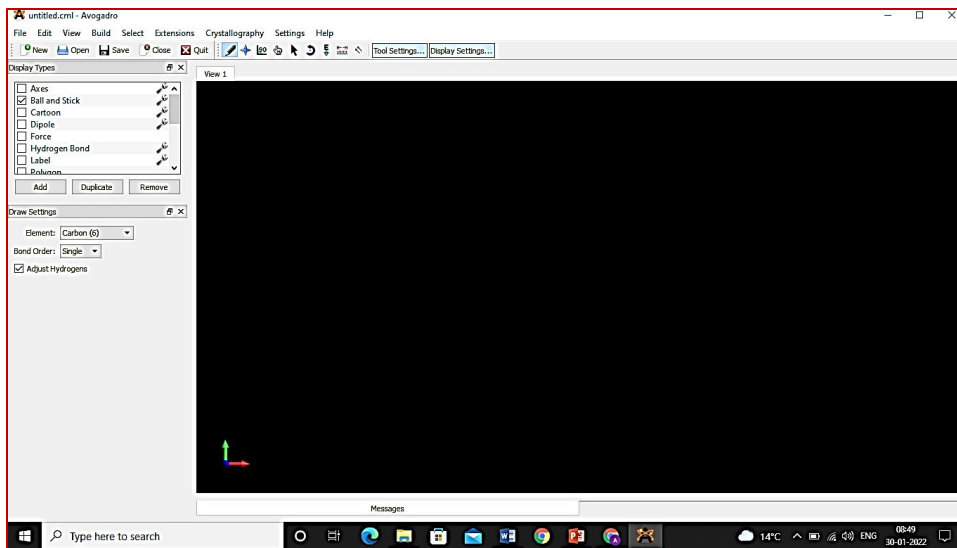
- To improve the ways of science learning.
- To advance science and math literacy and education worldwide through free interactive simulations
- <https://phet.colorado.edu/>
- Free science and math simulations for teaching STEM topics, including physics, chemistry, biology, and math, from University of Colorado Boulder.

Online Labs (OLabs) for School Lab Experiments – Interactive Simulations

- Digital content of school education is mapped
- Provides the opportunity to perform, record and learn experiments - anywhere, anytime, and individualized 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
- Downloaded from <http://avogadro.cc>

Stellarium

...Astronomy Software



- Free 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. [Presentation](#)

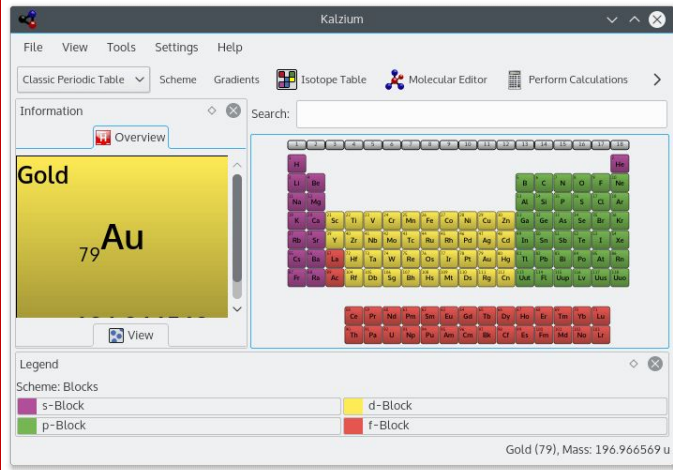
Learning Periodic Properties of Elements

☐ 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 information
- ✓ <https://www.rsc.org/periodic-table/#>



The screenshot displays the Kalzium application window. The title bar reads "Kalzium". The menu bar includes "File", "View", "Tools", "Settings", and "Help". Below the menu bar, there are several tool buttons: "Classic Periodic Table", "Scheme", "Gradients", "Isotope Table", "Molecular Editor", and "Perform Calculations". A search bar is located on the right side of the information panel. The main window is divided into two main sections. On the left, a large yellow square represents the element Gold (Au), with the atomic number 79 and the symbol "Au" displayed. On the right, a periodic table is shown with elements color-coded by block: s-Block (purple), p-Block (green), d-Block (yellow), and f-Block (red). A legend at the bottom left explains the color coding. The status bar at the bottom right shows "Gold (79), Mass: 196.966569 u".

Thanks for your
attention

for any queries...

Dr. Anand Kumar Arya

Associate Professor

Regional Institute of Education, Ajmer

NCERT, New Delhi

anandarya2001@yahoo.com

9461068296