

## Online Training on

### Integration of Virtual Labs in teaching-learning

Organized by Central Institute of Educational Technology, NCERT, New Delhi

# Virtual Labs - Learning Tool

Day 2 : 16-01-2024

Time : 04.00 pm – 05.00 pm

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# What is Virtual Lab



Sampling the Experience

Process & Planning of Learning Science

Exploring the Benefits

Learning Experience

Categories of Virtual Lab

Revolutionizing STEM Education



An MHRD Govt of India Initiative



# Virtual Lab?

- ▶ Virtual labs are
  - ▶ Interactive and
  - ▶ Digital Simulation
  - ▶ Real, Physical Labs





## **Virtual Lab As a Learning Tool**

- **For Facilitating, Managing, Assessing and Enriching Learning**
- **Environment to Develop laboratory skills**

# Categories of Virtual Lab

**Laboratories:** Platforms to simulate physical labs on screens.

**Simulations:** offer students an opportunity to explore from a remote location

**VR spaces:** VR or virtual reality classes offer more immersive experience.

# Revolutionizing STEAM Education



Understand the potential Of Virtual Labs



Transform The Way Teach & Learn



Make Students Develop Critical Thinking



Improve Innovation & Team Working Skills



Emphasize  
over  
traditional  
labs



Reduced  
costs,



Simplified  
maintenance,



Ability to offer  
a safe  
environment.



Build up  
experience &  
enthusiasm



Learn without  
Geographical  
limitations.

## Exploring the Benefits of Virtual



Lab

# Virtual Lab : How does it enrich learning

Helps to observe and inquire particular process and phenomena

Keep the learners engaged to manipulate

Deepens conceptual understanding & Motivation

To visualise the invisible phenomena like atomic structures, propagation of waves.

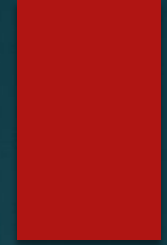
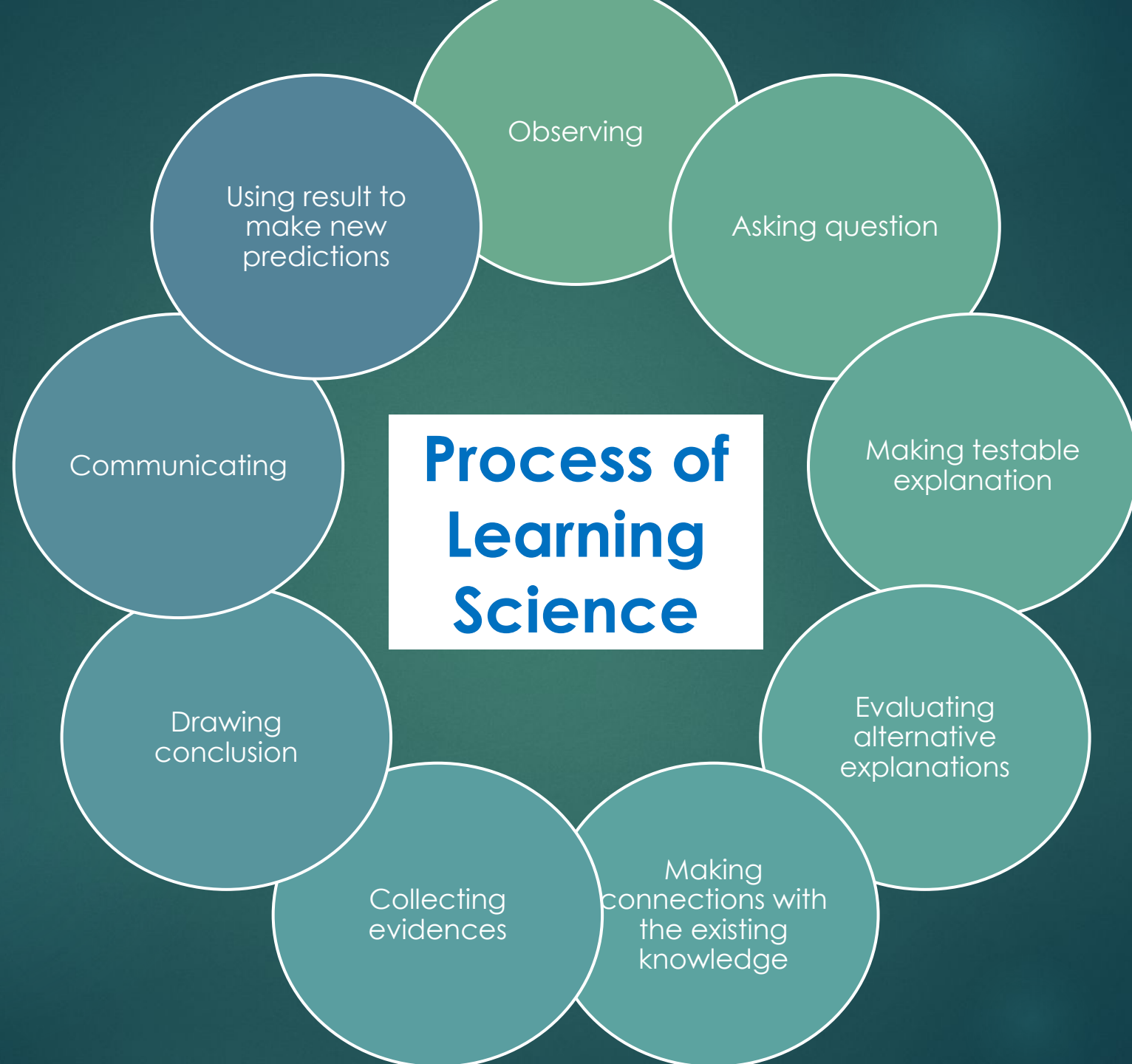


# Personalized Learning

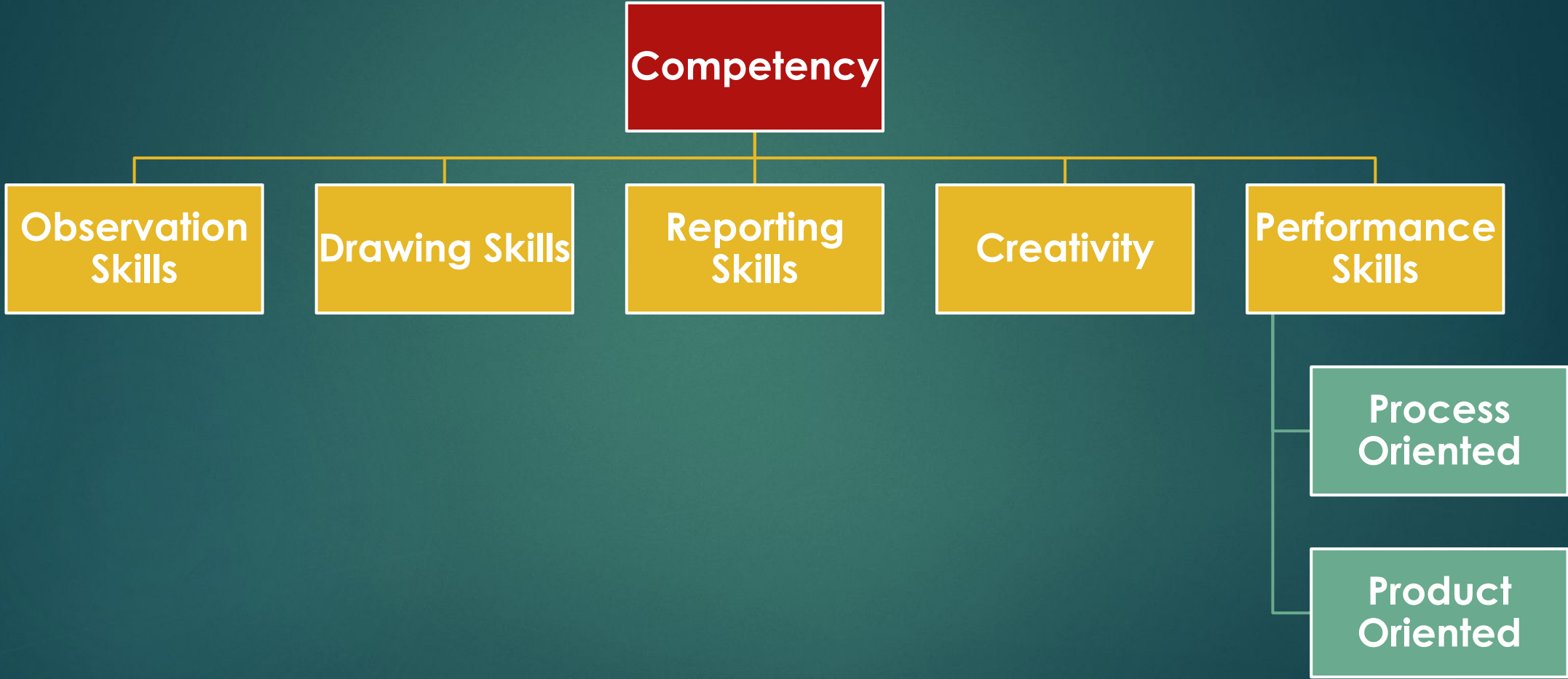
focuses on the ability of performing labs

provide personalized learning experiences

needs of individual students and disabilities



# Planning: Investigations/Experiments



## Competence: Observation Skills

- (i) *read* about instruments and measure physical quantities, keeping least count in mind,
- (ii) *follow* the correct sequence while making observations,
- (iii) *take* observations carefully in a systematic manner; and
- (iv) *minimise* some errors in measurement by repeating every observation independently a number of times.



## Competence: Drawing Skills



- (i) *make* schematic diagram of the apparatus,
- (ii) *draw* ray diagrams, circuit diagrams correctly and label them,
- (iii) *depict* the direction of force, tension, current, ray of light etc, by suitable lines and arrows; and
- (iv) *plot* the graphs correctly and neatly by choosing appropriate scale and using appropriate scale.



# Competency: Reporting Skills



- (i) *make* a proper presentation of aim, apparatus, formula used, principle, observation table, calculations and result for the experiment,
- (ii) support the presentation with labelled diagram using appropriate symbols for components,
- (iii) *record* observations systematically and with appropriate units in a tabular form wherever desirable,
- (iv) *follow* sign conventions while recording measurements in experiments on ray optics,
- (v) *present* the calculations/results for a given experiment alongwith proper significant figures, using appropriate symbols, units, degree of accuracy,
- (vi) *calculate* error in the result,
- (vii) *state* limitations of the apparatus/devices,
- (viii) *summarise* the findings to reject or accept a hypothesis,
- (ix) *interpret* recorded data, observations or graphs to draw conclusion; and
- (x) *explore* the scope of further investigation in the work performed.

## Competence: Creativity

- Most valuable skills of Human Being
- Pertain to the realm of
- Imagination



- Select
- Check
- Detect
- State
- Prepare
- Draw
- Setup
- Handle
- Identify
- Perform
- Represent
- Interpret
- Report
- Dismantle
- Follow

# Performance Skills

## Process

## Product

- Identify
- Set up
- Record
- Present
- Analyse
- Accept or reject







Simulations in Science, Mathematics and skill e-labs.

Animations, lab videos and text documents.

Perform and learn experiments - anywhere, anytime

Individualised practice in all areas of experimentation.

Content aligned to NCERT/CBSE and State Board syllabus.

# Sampling the Experience

Grade 6

Grade 10

Subjects Focussed

Science

Mathematics

Computer  
Science

Languages

Grade 11

Grade 8

Hindi

English

Grade 12

Grade 9

🔍 Explore

🔍 हिन्दी Medium

🔍 English Medium



## Ask Tara



Hello, I am Tara!  
I am your DIKSHA guide  
Please select your preference from the options I  
provide or type your query directly.

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DIKSHA mobile app

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Other DIKSHA queries

Type here...



