Virtual Labs - Learning Tool

Day 2 : 16-01-2024

Time : 04.00 pm – 05.00 pm

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Associate Professor – DICT & TD

What is Virtual Lab

Sampling the Experience

Learning Experience

Process & Planning of Learning Science

Overview

Categories of Virtual Lab

Exploring the Benefits

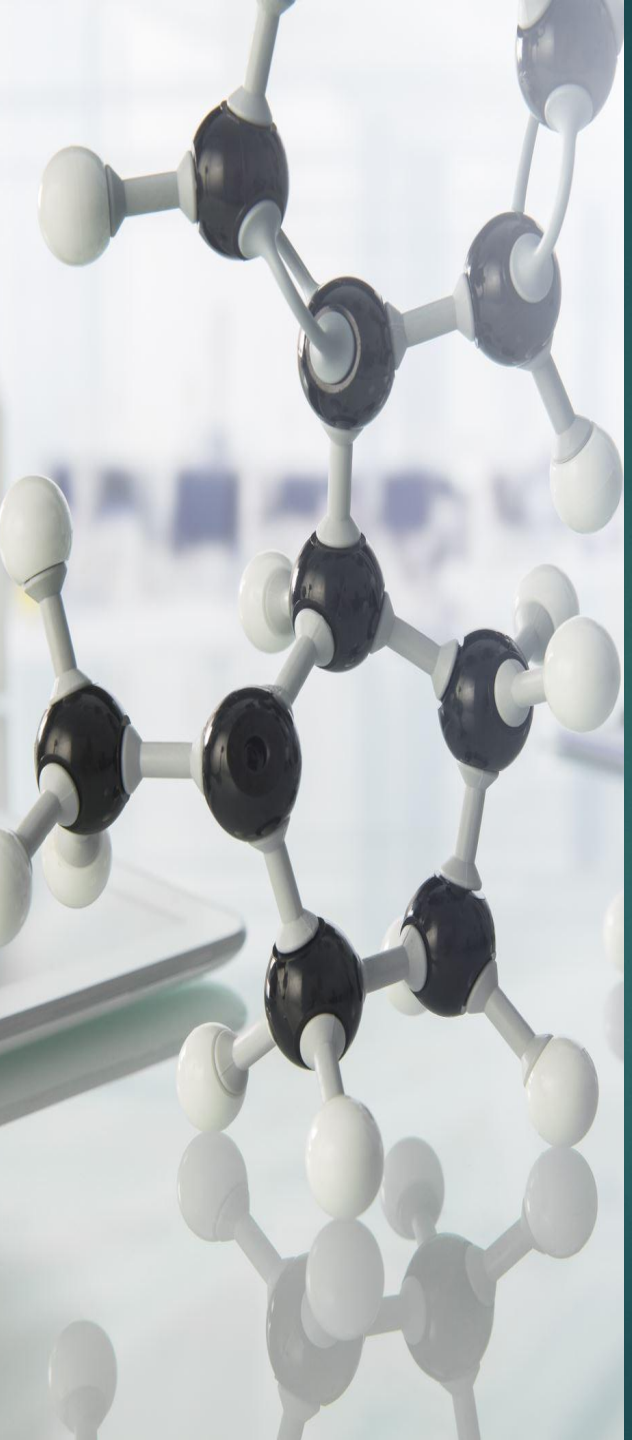
Revolutionizing STEM Education

Virtual Labs

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.

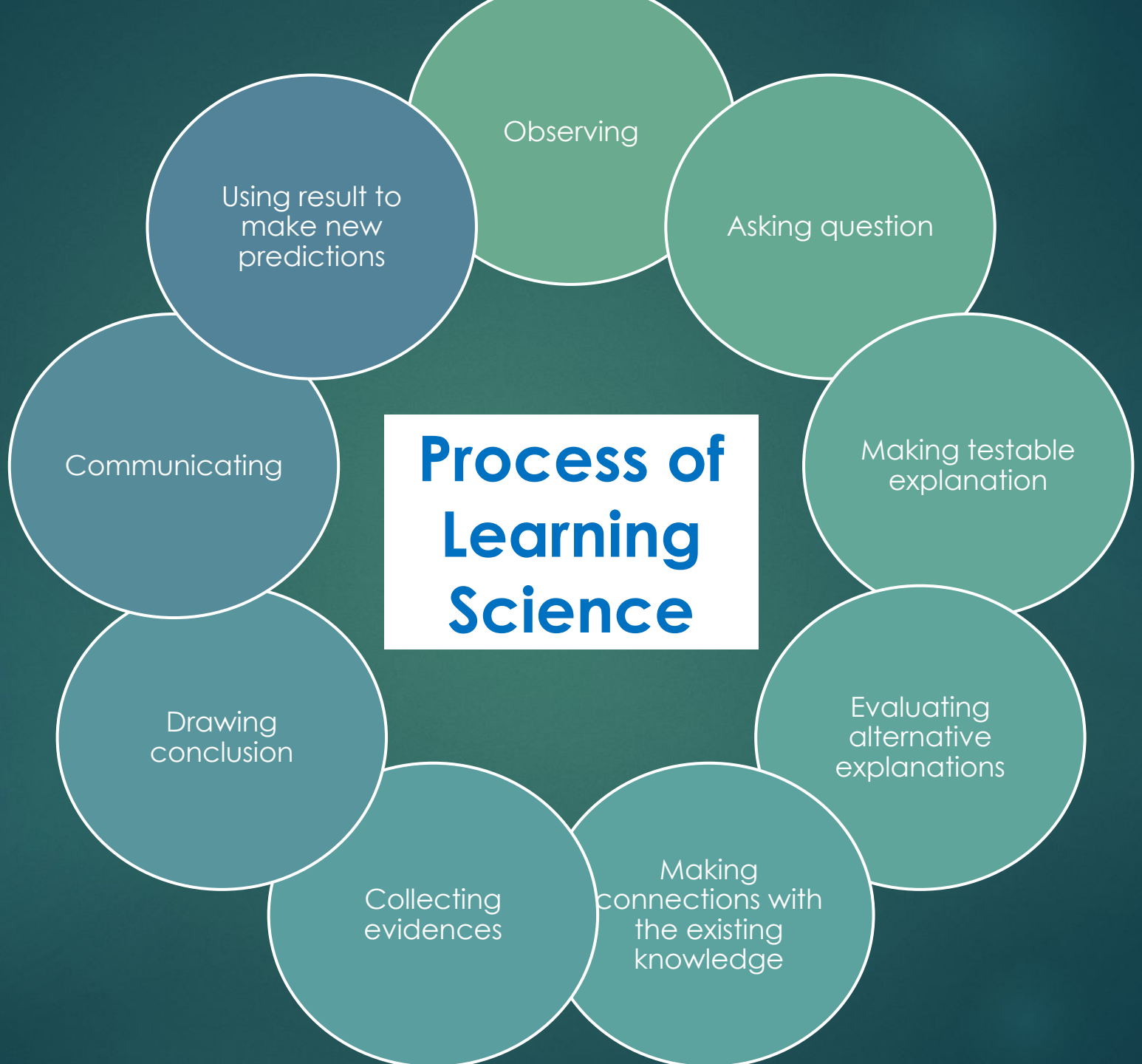
Exploring the Benefits of Virtual Lab

Virtual Lab : How does it enrich learning

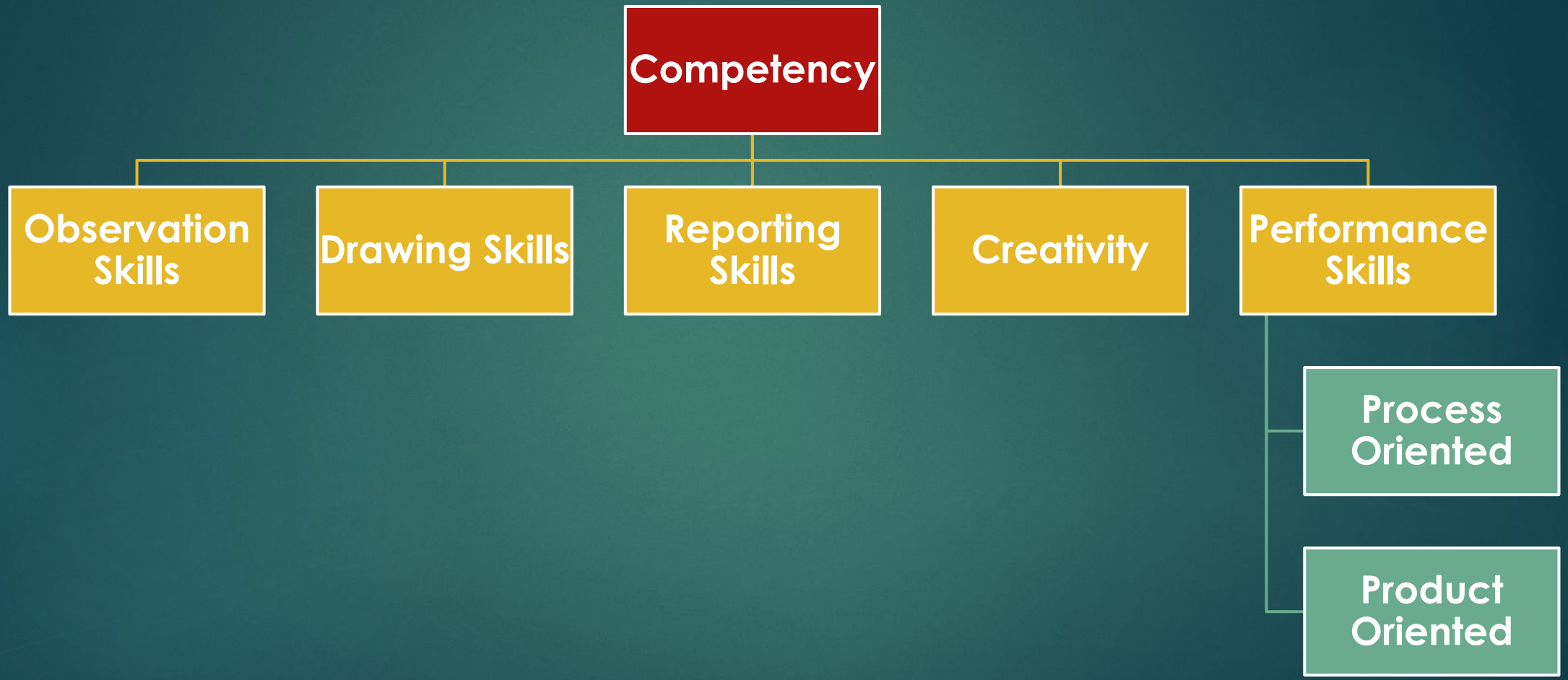
- Helps to observe and inquire particular process and phenomena
- Keep the learners engaged to manipulate
- Deepens conceptual understanding & Motivation
- To visualise the invisible phenomena like atomic structures, propagation of waves.

Personalized Learning

- focuses on the ability of performing labs
- provide personalized learning experiences
- needs of individual students and disabilities


Process of Learning Science
Observing
Asking question
Making testable explanation
Evaluating alternative explanations
Making connections with the existing knowledge
Collecting evidences
Drawing conclusion
Communicating
Using result to make new predictions

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,

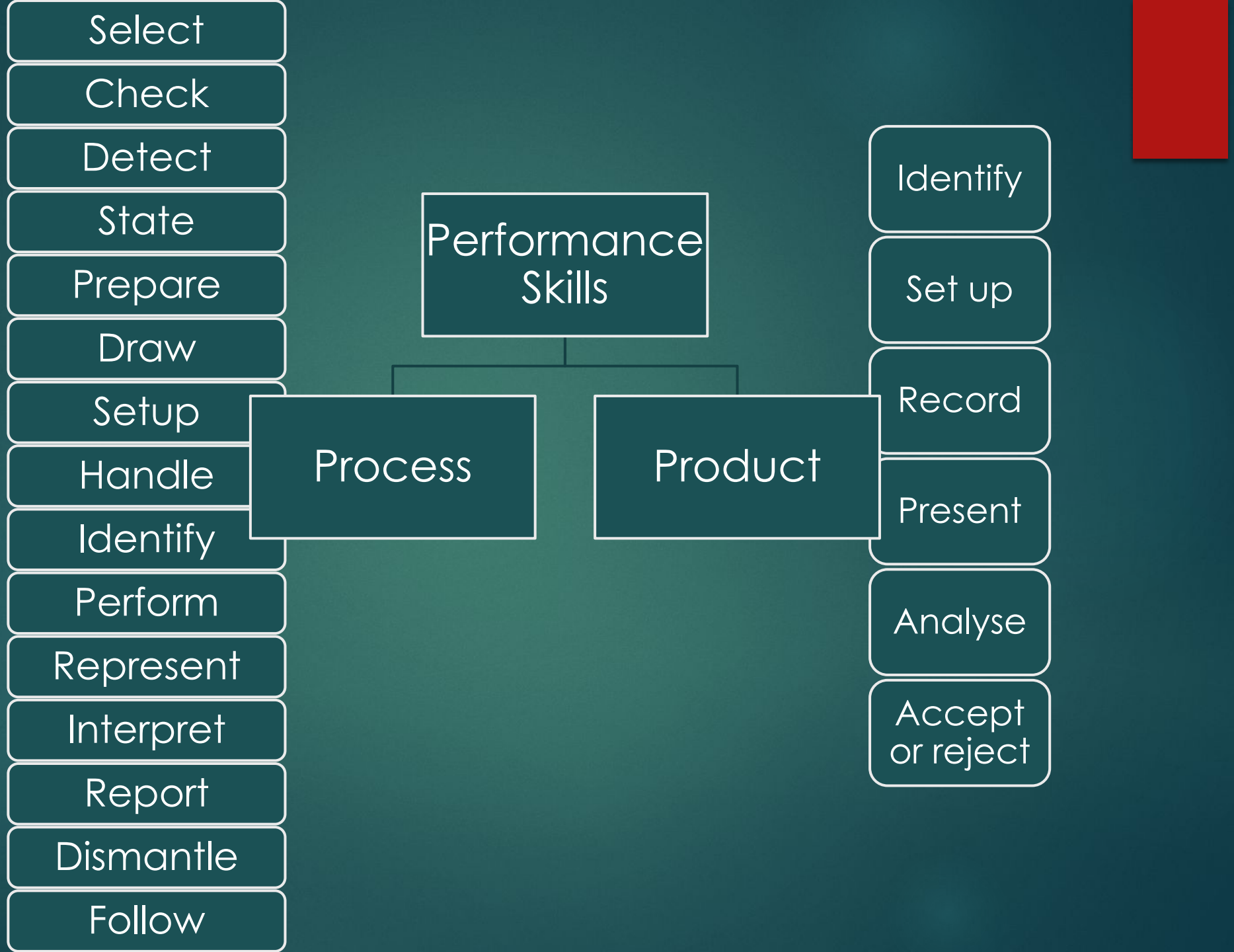
(viii) *summarise* the findings to reject or accept a hypothesis,

(ix) *interpret* recorded data, observations or graphs to draw conclusion; and

(x) *explore* the scope of further investigation in the work performed.

Competence: Creativity

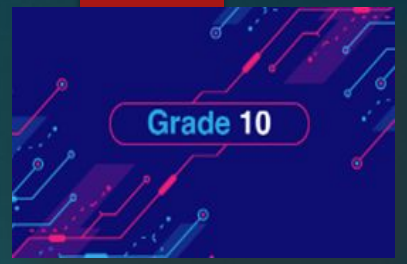
- Most valuable skills of Human Being
- Pertain to the realm of
- Imagination


Performance Skills
Process
Product
Select
Check
Detect
State
Prepare
Draw
Setup
Handle
Identify
Perform
Represent
Interpret
Report
Dismantle
Follow
Identify
Set up
Record
Present
Analyse
Accept or reject

Diksha - virtual labs

- 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

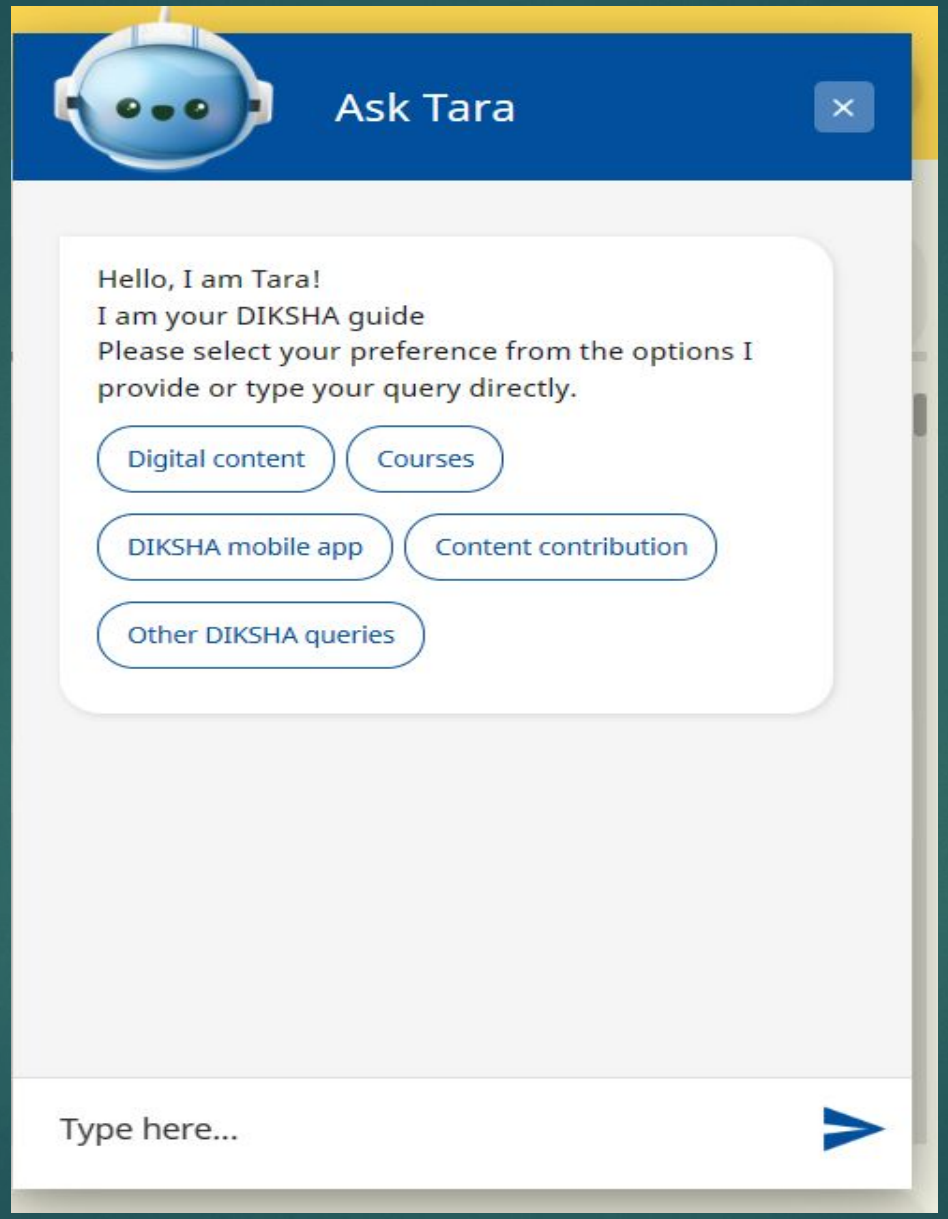


Subjects Focussed

- Science
- Mathematics
- Computer Science
- Languages
  - Hindi
  - English

Explore

- हिन्दी Medium
- English Medium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Thank
You!