

Integration of Virtual Labs in Teaching-Learning of Science

By-

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Being a teacher, do you consider a variety of pedagogical approaches and learning outcomes required to be achieved while designing a lesson plan?

Being a learner, do you consider achieving learning outcomes during your learning process?

Learning outcomes can be achieved by incorporating Virtual Labs in the lesson plan

Virtual labs for Middle classes

Suggested Pedagogical Processes for Middle classes- 6th to 8th

The learner is to be provided with opportunities and encouraged to —

- explore surroundings, natural processes, phenomena using senses
- pose questions and find answers through reflection, discussion, designing and performing appropriate activities,
- record the observations during the activity or experiments,
- analyse recorded data, interpret results and draw inference/ make generalisations

Learning Outcomes for Middle classes- 6th to 8th

The learner —

- identifies materials and organisms
- differentiates materials and organisms
- draws labelled diagrams
- conducts simple investigations to seek answers to queries
- measures and calculates
- plots and interprets graphs
- applies learning of scientific concepts in day-to-day life

Examples of experiments to achieve learning outcomes for Middle classes- 6th to 8th

Identify the parts of a flower and distinguish between unisexual and bisexual flowers

https://diksha.gov.in/play/collection/do_3135898447443312641324?contentId=do_31396200419473817611828

To find the speed of hopping on one leg

https://diksha.gov.in/play/collection/do_3135898447443312641324?contentId=do_3136095401367552001675

Virtual labs for Secondary classes

Suggested Pedagogical Processes for Secondary classes-9th & 10th

The learners may be provided with opportunities and encouraged to—

- design and carry out activities
- present their observations/ ideas/ learning through flowcharts/ concept maps/ graphs
- analyse and interpret the graphs
- explore the relationship between two physical quantities
- find out 'why' and 'how' of processes or phenomena

Learning Outcomes for Secondary classes- 9th & 10th

The learner—

- develops understanding of concepts & principles
- plans and conducts investigations or experiments to arrive at and verify the facts
- relates processes and phenomena with causes and effects
- analyses and interprets graphs and figures
- communicates the findings and conclusions effectively
- develops scientific temper (objectivity, critical thinking)
- nurtures natural curiosity and creativity

Examples of experiments to achieve learning outcomes for Secondary classes- 9th & 10th

Separate the components of a mixture of ammonium chloride, salt and sand

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Liberation of Carbon Dioxide gas during Fermentation

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Suggested Pedagogical Processes for Secondary classes- 11th & 12th

The learners may be provided with opportunities and encouraged to —

- ask questions on the basis of observations
- design and carry out activities/experiment/investigations to find the answer to their queries
- connect with the daily life experiences
- present their observations/ ideas/ learning through flowcharts/ concept maps/ graphs
- select and use appropriate devices for understanding of structural and physiological and other intricacies of living organisms.

Learning Outcomes for Secondary classes- 11th & 12th

The learner—

- relates processes and phenomena with causes and effects
- makes linkages at the interface of Biology/Chemistry/Physics with other disciplines
- draws labelled diagrams, flow charts, concept maps & graphs
- communicates the findings and conclusions effectively
- applies scientific concepts of Science in daily life and for solving problems

Examples of experiments to achieve learning outcomes for Secondary classes- 11th & 12th

Steps of Artificial Hybridization

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Paper chromatography

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To demonstrate interconversion of Potential and Kinetic energy

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Enjoy learning!

