

## Problem-Based Instructional Strategy

The uniqueness of the laboratory lies principally in providing students with opportunities to engage in processes of investigation and inquiry. The laboratory is especially important in the current era in which *inquiry* has re-emerged as a central style advocated for science teaching and learning. During inquiry tasks, students can engage in cycles of formulating questions, generating hypotheses, planning and carrying out experiments and finally analyzing and summarizing their results. Such inquiry cycles are assumed to improve students' metacognitive skills as well as their subject-matter expertise.

In this style, students are presented with a problem statement often lacking in crucial information. From this statement they redefine the problem in their own words and devise a procedure that will lead them to a solution. The problems are “open-ended”. That is, they possess a clear goal, but there are many viable paths toward a solution.

In order to design your own experiment with the Problem-Based Instructional Strategy please use the template available in the online SDVice tool at the link

[http://vlabs.iitb.ac.in/vlab\\_tool\\_beta/](http://vlabs.iitb.ac.in/vlab_tool_beta/)

Steps	Guidelines for task design	Guidelines for task performance by students
1	Articulate the learning outcomes of the project. What do you want students to know or be able to do as a result of participating in the assignment?	State the learning objectives of the experiment.
<b>Problem Definition Phase</b>		
2	Create the problem. Ideally, this will be a real-world situation that resembles something students may encounter in their future careers or lives. Cases are often the basis of PBL activities.	Assign tasks and assessment questions so that the students will examine and define the problem.  Explore what they already know about underlying issues related to it.
<b>Research Phase</b>		
3	Establish ground rules at the beginning to prepare students to work effectively in groups.	Assign tasks and assessment questions so that the students will determine what they need to learn and where they can acquire the information and tools necessary to solve the problem.

<b>Proposed Solution Phase</b>		
4		Assign tasks an assessment questions so that the students will evaluate possible ways to solve the problem.
<b>Implementation Phase</b>		
5	Establish how you will evaluate and assess the assignment. Consider making the assessments students make of their own work and that of their peers part of the assignment grade.	Assign tasks an assessment questions so that the students will solve the problem.
<b>Desired results</b>		
6		Assign tasks an assessment questions so that the students will report on their findings.