

**Center for Pre-College Programs
New Jersey Institute of Technology**

Assessment of Lesson Plans

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THE EDGE IN KNOWLEDGE

**Why Evaluate
Lesson Plans?**



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**Assure the Quality of
Your Lesson Plans**

**Assure the Quality of Lesson
Plans from Other Sources
(E.g., Internet)**



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Quality Standards-Based Lesson Plans

- Have a specific standard (or portion of it) that maps to no more than 4 outcomes.
- Have lesson objectives stated in measurable outcomes.
- Have lesson activities that provide the opportunity to achieve the outcomes within the time period allowed for instruction.
- Include an assessment of the outcomes that demonstrate students' achievement of the skills and knowledge specified in the standard.



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Elements of a Rubric to Evaluate Standards-based Lesson Plans

- Standards or indicators appear in the plan
- Objectives derived from Content statement of standard
- Objective: Cognitive Knowledge *
- Objective: observable and measurable
- Performance Descriptors
- Lesson Activities
- Evaluation of the lesson

* Based on the categories of Bloom's taxonomy.



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Standards-Based Lesson Plan Rubric

| | 0 | 1 | 2 |
|--------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Standards and indicators appear in the plan | 4 or more standards cited, unfeasible | Full text of standards with No editing | Standard and indicator trimmed and feasible |
| Objectives derived from content standards | Objectives unrelated to selected standard | Objectives related, but not sufficient to assess expected learning in standard | Objectives result in student performance matched to content of standard |
| Objectives: Value | Objective leads to trivial product, or no product | Objective at comprehension or knowledge level | Objective at analysis or higher level |
| Objective #1 Objective #2 Objective #3 Objective #4 | | | |



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Standards-Based Lesson Plan Rubric (cont.)

| | 0 | 1 | 2 |
|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------|
| Objectives: observable and measurable Objective #1 Objective #2 Objective #3 Objective #4 | Verb choice not visible, e.g. "learn", "know" | Observable, for some students only or, does not display knowledge | Behavioral verb and product that can be evaluated |
| Performance Descriptors Descriptor #1 Descriptor #2 Descriptor #3 Descriptor #4 | No qualifying statement to identify proficient performance | Qualifying statement vague w/out clear criteria of proficiency | Subjective and Quantitative expectations describe proficient product |



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Standards-Based Lesson Plan Rubric (cont.)

| | 0 | 1 | 2 |
|--------------------------|-----------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|
| Lesson activities | Not provided or vague, no products evident | Student action clear but unlikely that objectives will result | Student actions likely to result in products of objectives |
| Evaluation | No evidence that student products will result | Assessment tool does not match products of objectives | Assessment tools assure products of objectives are all produced |



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Lesson Topic: Models of Solutions and Concentrations

- **PURPOSE:** Give students a model to work with which will demonstrate the manner in which solutions are formed.
- **OBJECTIVES:** Students will be able to:
 - Discuss pure solutions.
 - Discuss dilute solutions.
 - Discuss concentrated solutions.
 - Discuss the volumetric changes which occur.
 - Apply use of the model to future learning.
- **Classroom activities:**
 - Students are provided with two beakers, each containing different size plastic spheres.
 - The volume of the spheres in each beaker is measured.
 - The smaller spheres are poured into the beaker of larger spheres and the volume of the mix of spheres is measured.



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Lesson Topic: Rate of Reaction

Learning Objectives: Students will be able to:

1. solve the problems using molarity by calculating the number of moles in the solution, and they will present the problems on the board.
2. collect the data of measurements during chemical change of reaction of Alka Seltzer in different temperatures and for different concentrations of drug as a function of time and draw graphs.

PARAMETERS TO EVALUATE STUDENT WORK PRODUCTS:

- Lab report
- Works well together in a group.
- Listens to instructions.
- Clean up procedures followed.



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Lesson Topic: Mass Transfer

- **Aim:** This practical aims to determine the rate of dissolution of boiled sweets in water and the factors which affect it.
- **Classroom activities:**
 - Rate of dissolution of a sucker is measured by measuring the change in diameter as a function of time under different conditions.
 - A beaker of cold water is stirred at different stirrer speeds.
 - Rate of dissolution is measured at different temperatures.
- **Analysis:** Compare the change in diameter for the different conditions studied. Then try to determine relationships for the rate of dissolution of the sucker, using what you know about diffusion and mass transfer.
- **Discussion:** Explain the differences between the results and how the relationships you have found account for these differences.



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Engineering Your Own Spectrograph

https://www.teachengineering.org/view_activity.php?url=collection/cub_/activities/cub_spect/cub_spect_activity7.xml

A Step Towards Discovery: Inquiry Skills in Science

Measuring Surface Tension

https://www.teachengineering.org/view_activity.php?url=collection/duk_/activities/duk_surfacetensionunit_activities/duk_surfacetensionunit_act2b.xml



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Pharmaceutical Research Design Problem

https://www.teachengineering.org/view_lesson.php?url=collection/mis_/lessons/mis_pharma/mis_pharma_lesson01.xml

Conveyor Engineering

<http://tryengineering.org/lesson-plans/conveyor-engineering>



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Q & A



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