


Measuring Student Learning:
Performance Assessment Use
in Physics

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WNYPTA
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Rationale

Studies

- Second International Science Study
- Third International Mathematics and Science Study
- National Assessment of Educational Progress

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Development of National Standards

Science for All Americans (AAAS, 1989)

National Science Education Standards (NRC, 1996)

Emphases:
process skills, inquiry and constructivism in
science teaching and learning.

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Problem Solving Model*

- Plan
- Obtain data
- Organize data
- Analyze data
- Generalize from the data
- Make decisions based upon the data

*New York State Regents Physics Syllabus, Appendix A (1988)

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Process Skills Models

Lunetta and Tamir (1979) - four foci:

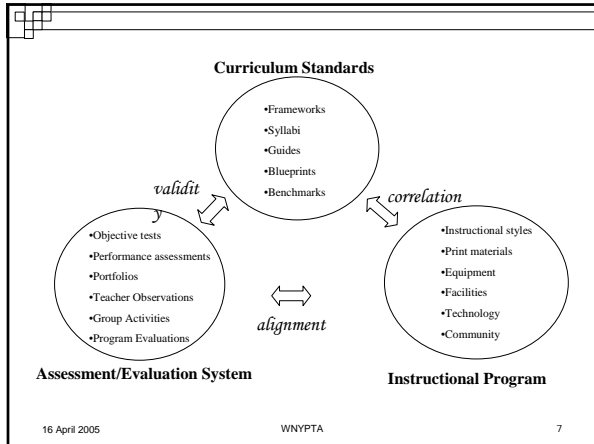
- Planning
- Performing
- Analyzing and interpreting
- Application

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Development of NYS Standards

- NYS Learning Standards in Mathematics, Science and Technology (NYSED, 1996)
- Developed from the NSES and SFAA
- Standards: 1 – Analysis, Inquiry and Design, Scientific Inquiry, 2 – Information Systems, 3 – Math, 4 – Science, 5 – Technology, 6 – Common Themes, 7 – Interdisciplinary Problem Solving

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Some Assessment Options

	Responses Selected	Objectively Scored	Conventional Assessments
True-False Item			
Multiple-Choice Item			
Matching			
Modified Objective			
Completion			
Short Answer			
Essay			
Papers			
Lab Reports			
Observations	Constructed Responses	Subjectively Scored	Alternative Assessments
Discussion	• open		
Interviews	• free		
Skills Check-List			
Performance Testing			
Lab/Field Practicals			
Projects			
Poster-Board Session			
Portfolios			
Self Rating			
Peer Rating			

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- ## NYS Assessments
- Multifaceted – Multiple Choice, Constructed Response, Extended Constructed Response
 - Performance Assessment Component – Part “D”
 - Various organizations
 - Integrated (Physics, Chemistry)
 - Independent (Earth Science)
 - Surrogate (Biology)
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Dimensions of Performance Assessment

Doran and Reynolds (1996):

- Novelty
- Structure
- Sequence
- Level

Proposed:
Organization

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The Independent Model -- Features


- Usually several stations
- Separate foci (within general area/topic)
- Several skills are tested
- Less time per task (station)
- Less "double jeopardy"

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The Surrogate Model -- Features


- Assessment is a follow-up to a (prior) hands-on, in-class activity
- Assessment calls for students to critique evidence (data/conclusions/plans) from other students
- Assessment requires students to extend conclusions stated/predict to new investigation
- Students use their prior experiences
- No demand for equipment and materials
- No safety concerns

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 **The Integrated Model – Features**


- Usually single location (lab site)
- A single overarching focus (context)
- A family of skills assessed
- Often a complete investigation

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 **Today's Agenda**

- Overview of Performance Assessment formats
- Examples from
 - NORC Performance Assessment Task Collection
 - Sample task following current thinking for NYS Physical Setting: Physics
- Questions/Concerns/Comments

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 Thank you for your time and patience! Please feel free to contact me with questions, concerns or comments:

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