

AAPT/PTRA Center for Eastern Idaho

Idaho State University Departments of Physics,
Mathematics, and Educational Foundations in
Partnership with School Districts

25, 55, 58, 91, 93 and 401

Funded by the Idaho State Board of Education MSP
Program for 2008 - 2011



Disclaimer

The instructional practices and assessments discussed or shown in these presentations are not intended as an endorsement by the U. S. Department of Education

Outline

- Program Goals and Objectives
- Idaho Program Development
- Background and History of AAPT/PTRA
- AAPT/PTRA Professional Development Model
- Summer Workshop
- Fall Workshop
- Assessments for 2008
- Future Plans



Program Goals and Objectives

- Improve student performance in physical science and mathematics in the target schools.
 - All target schools will meet Idaho's AYP targets in student performance on all physical science portions of the science ISAT for at least two of the three years of this project, and to bring them into compliance with Idaho's AYP targets in mathematics.
 - Move all physical science teachers in the district partners currently not classified as Highly Qualified to that status.

Program Goals and Objectives

- Improve the teaching ability of teachers participating in this project. Teachers participating in this project will improve:
 - Content knowledge
 - Confidence in teaching physics and physical science
 - Use and confidence in instructional and information technology
- Success measured by assessment tests, surveys, and classroom observations.

Idaho Program Development

- Development Team met 2006 – 2007 and chose the AAPT/PTRA Professional Development Model
- Core Planning Team formed in 2007 to prepare proposal
 - Three ISU faculty from Physics, Mathematics, and Education
 - Three teachers, one each from elementary, junior high, and high school
 - Two principals
 - One Coordinator of Assessment and Program Evaluation
 - Jan Mader, PTRAs Director for the Western U.S.

Idaho Program Development

- CPT Reviewed Proposed AAPT/PTRA Curriculum and Alignment to Idaho Science and Mathematics Content Standards In April & May, 2008
- Modified Curriculum for Summer 2008 to Better Address Standards
 - Include more Applications of Geometry and Fractions
 - Stress Graphical Display and Interpretation of Data
- University of Wisconsin Survey of Enacted Curriculum (SEC) Used to Determine Emphasis Areas

Background and History of AAPT/PTRA

- American Association of Physics Teachers (AAPT) is the premier organization in the U.S. devoted to supporting and improving physics education
- The Physics Teaching Resource Agents (PTRA) program was established in 1985 to provide accessible professional development for teachers of physical science and physics of the highest quality
 - Supported by the AAPT, APS, eight NSF grants, and seven MSP grants
 - Twenty-four urban centers, thirty-two rural centers, and 380 trained PTRA's

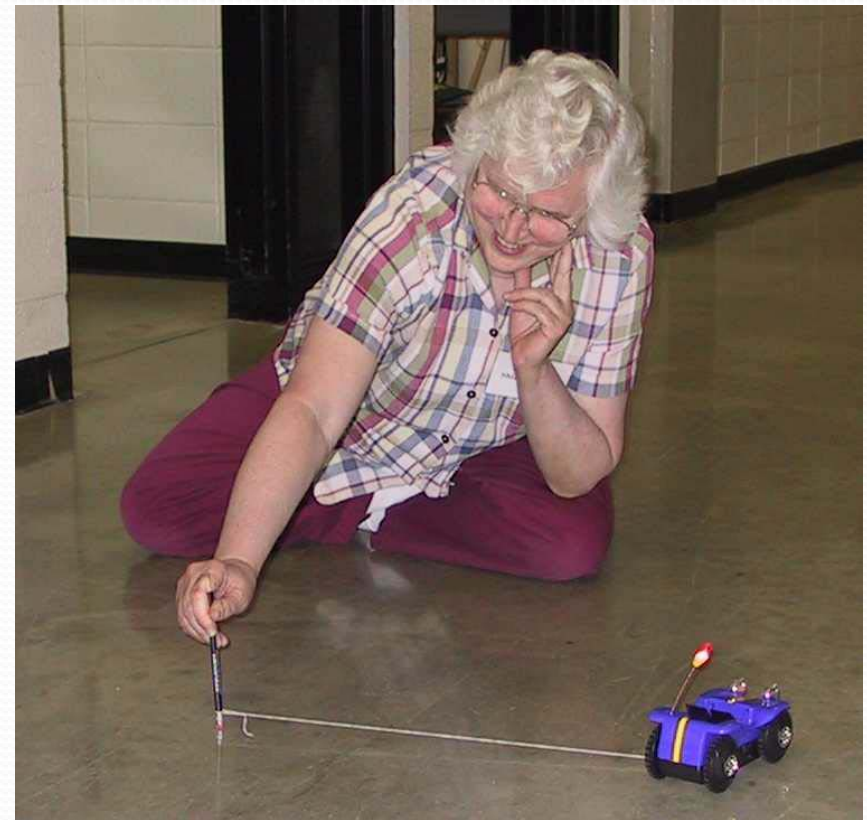
AAPT/PTRA Professional Development Model

- Professional Development Lead/Taught by Peers (PTAs)
- Thoroughly Tested Research Based Curriculum
- A Minimum of Three Years of Professional Development
 - Summer Workshop Plus a Follow-Up Workshop During Spring of Fall Each Year
 - Ensure Coverage of All Major Physical Science Topics
 - Instill Confidence in Content, Pedagogy, and Technology
 - Form Supportive Communities of Educators and Learners

- Encourage Development of Major Concepts from Laboratory Experience (Not from Lecture or Book)
- Provide Content as Well as Instructional Strategies in a Contextual Setting
- Many Inquiry Activities Done by Participants as if They Were Students
- PTRAs Undergo Yearly Training in Content, Pedagogy, Curriculum, and Technology
- Tested Assessment Instruments
- Established Infrastructure for Professional Development



- Present Both High & Low Technology Examples of Lesson Plans and Laboratories



Summer Workshop 6/15 – 6/20

- Thirty-two Teachers, Three PTRAs
 - Seven teachers supported by AAPT/PTRA
 - Twenty-Three MSP-supported teachers from target districts
 - Two MSP-supported teachers from other Idaho districts
- Forty-Six Contact Hours of Instruction on Kinematics and Dynamics Concepts, Mathematical Applications, Teaching Methods, Activities, and Demonstrations
- Six Hours of Online Pre-Workshop Surveys on Conceptual Understanding, Attitudes, and Teaching Practices and Resources

Instructional Strategies

- Five E Learning Cycle (Engage, Explore, Explain, Elaborate, Evaluate)
- Inquiry Laboratory Activities
- Modeling Techniques
- Identification of Student Misconceptions
- Ranking Tasks
- Graphical Analysis of Data



Instructional Strategies

- Use of Technology
 - Graphing Calculator (TI-83)
 - PASCO and/or Vernier Computer Interfacing
- Use of Physlets
- Practicums
- Pair Share (check with you neighbor)
- Public Presentation (e.g., White Boarding)
- Questioning Techniques (What if ...)



Fall Workshop 10/3 – 10/4

- Twelve Hours of Instruction
- Discussion of Implementation of AAPT/PTRA Instruction Strategies
- Follow-Up Conceptual Reinforcement on Topics Where There Was Less Improvement on Post-Test after Summer Workshop
- Construction of Hovercrafts and Dynamics Carts
- Laboratories and Activities Using Hovercrafts and Dynamics Carts



Assessments For 2008

- Provided by Education Assessment & Testing (EAT) Inc.
- For the Pre and Post-Workshop Content Knowledge Tests, Improvement was Seen in 22 of the 35 Questions.
 - Revisit low-performance topics in 2008 Fall Workshop, and again in the 2009 summer workshop
- The Project “significantly increased the confidence level for the participants. The increase ... indicate levels that should impact teaching practices”

Future Plans



- Topics for 2009:
Newton's Laws, Energy, Momentum, Gravity, and Circular Motion
- Topics for 2010:
Electrostatics, Electricity, Electric Circuits
- Review Curricula and Develop Pedagogy for Elementary Teachers in Science Within the AAPT/PTRA Professional Development Model
 - Submit Proposal to the Idaho MSP Program in Jan. 2010
 - Submit Proposal to the NSF Science of Science and Innovation Policy (SciSIP) Program in 2010 or 2011