




# Preparing Principals to Support Effective Science Instruction



# Local Systemic Change (LSC) Projects

- Designated instructional materials
- 130 hours of professional development
- Target all teachers, not just volunteers
- Address the “system” constraints and incentives



Lesson Learned in the LSC:  
Importance of Involving  
Principals Early and Often



# LSCs: Strategies for Involving Principals

- Workshops ranging from several hours to several days on goals, vision, and activities.
- Hook into existing professional development for principals.
- Align the vision with principal routines
  - Materials
  - Curriculum
  - Testing
  - Classroom observations/teacher evaluation



# “Potatoes” Lesson Context

- This is a science lesson in a K-1 class.
- The students have been studying plants throughout the school year. The students have grown and tended a flower garden from seeds.



# During the pre-interview, the teacher revealed that...

- The main purpose of this lesson is to have the students understand that some plants can be grown without starting from seeds. A secondary purpose of this lesson is to have the students begin to make predictions and then express their ideas by recording them in journals.
- The teacher planned this lesson to address the students' idea that all plants have to be grown from seeds.



# During the pre-interview, the teacher revealed that...

- Just prior to this lesson, the teacher introduced the potato to the students by having them generate a list of things they know about potatoes. Then she had them make observations of smooth potatoes and potatoes that had sprouted. Finally, she asked the students to think about how potatoes grow.



# During the pre-interview, the teacher revealed that...

- Some students thought the sprouts were seeds, with many expressing the idea that the sprouts had something to do with the growth of potatoes. While sharing ideas on the sprouts' function, some students said that they thought that if you planted a sprouting potato, it would continue to grow into a larger potato; other students said that the sprout would produce another potato next to the first one, if planted.

# During the pre-interview, the teacher revealed that...

- During this lesson, students will work in pairs to design an experiment to test how to grow a new potato.
- Students' understanding of the lesson's science concepts will be assessed by reviewing the students' experiment designs in their plant journals. At the end of the unit, the students will share what they have learned about potatoes in group presentations.
- The teacher would like feedback on her questioning to get at student understanding.



# “Potatoes”

## Small Group Task

- Watch the videotaped lesson.
- At your table, discuss the strengths and weaknesses of the lesson. Your facilitator will document your discussion.



# “Potatoes”

## Small Group Task

- Think of the principal of the last school where you worked (or an elementary principal that you know). As a group, pick one area where you believe these principals would have differed from your assessment of the lesson.
- Facilitator will report to the large group



# Classroom Observation Protocol

- Can help illustrate your vision of quality science instruction
- Provides a guide for observing science lessons
- Points to specific indicators important to look for when observing science lessons
- Provides a common language



# Classroom Observation Protocol

- Assumes the observer has some knowledge of science
- Clearly fits within an evaluation context



# Observation Sequence

- Pre-observation Interview  
(on white paper in folder)
- Observation - documented on observation protocol (white paper in folder)
- Post-observation Interview  
(attached to pre-interview)



# Pre/Post Interview

- Context of lesson
  - Purpose/goals
  - What was experienced before
  - What will come after
- Plans for on-going and summative assessment



# Pre/Post Interview

- Area(s) to focus on in the observation
- Teacher's reflections on the lesson
  - What students learned
  - How they would change the lesson in the future
  - What they'll do next
- Professional development needs



# Classroom Observation Protocol

- Lesson Characteristics (page 1)
  - Purpose and context



# Classroom Observation Protocol

- Lesson Ratings in Component Areas (page 2-4)
  - Science content
  - Implementation
  - Science Classroom Culture



# Classroom Observation Protocol

## ■ Overall Lesson Ratings

- Likely Impact of Instruction on Students' Understanding of Science (Page 5)
- Capsule Description of the Quality of the Lesson (Page 6)

# Capsule Rating (Page 6)

Level 1: Ineffective Instruction

Passive “Learning”

Activity for Activity’s Sake

Level 2: Elements of Effective Instruction

Level 3: Beginning Stages of Effective Instruction (3 sub-levels)

Level 4: Accomplished, Effective Instruction

Level 5: Exemplary Instruction

Rating based on the observer’s assessment of the likely impact of the lesson on students’ understanding of science or their capacity to successfully “do” science



# Classroom Observation Protocol

- **Teacher and Observer Reflections (Pg 7-8)**
  - **Teacher as Reflective Practitioner**
  - **Teacher's strengths and areas in need of improvement based on observation and interview**
  - **Feedback on designated focus area**
  - **Recommendations for continued professional growth**



# All Sorts of Leaves

- Read Pre-interview (Green paper in folder-both sides)
- Watch Lesson
- Read Post-interview (Blue paper)
- Complete “Science Content” section on page 2 of the observation protocol (extra copy on white paper in folder)



# Small Group Task

- Discuss issues that you will likely encounter related to principals observing science instruction using a protocol.
- Pick one to share with the large group



# Challenges of principals observing science lessons:

- A nice culture can lead them to think the lesson is better than it is.
- They may not notice if an emphasis on literacy is in place of an emphasis on important science content.
- They may confuse the “features of reform” with teaching for understanding.



# Tools for Principals

## ■ TE-MAT

Teacher Education Materials Project

□ [www.te-mat.org](http://www.te-mat.org)

□ An online database of reviews of materials for K-12 mathematics and science professional development providers



# Tools for Principals

- Lenses on Learning

- *Module 3: Observing Today's Mathematics Classroom*

- Grant, C.M., et al., 2003, *Lenses on Learning*. Parsippany, NJ: Pearson Learning.
    - [www.pearsonlearning.com](http://www.pearsonlearning.com)



# Lenses on Learning: Module 3

## ■ Goals:

- Develop an eye for standards-based classrooms
- Come to understand what a teacher's long-term mathematical agenda might be and the role of such an agenda in teaching
- Begin to rethink your supervisory relationship with teachers from “dispensing expert advice” to becoming a collaborative inquirer with the teachers in your district



# Lenses on Learning: Module 3

- **Prior to the observation:** Understand where this lesson fits into the sequence of instruction for this class.



# Lenses on Learning: Module 3

- **During the observation:** Focus on the mathematical content and the students' mathematical thinking.



# Lenses on Learning: Module 3

- **After the observation:** Engage in non-hierarchical “co-inquiries” with the teacher.