

OBSERVING FOR EVIDENCE OF LEARNING

Essential Elements

Collaborative Lesson Development Phase (Day 1)

- Teachers develop statements that clearly identify the big ideas that students will learn
- Teachers check their own understanding of the big idea by discussing their current understanding
- Lesson development focuses on activities that address the science big idea
- Teachers craft questions to move students' thinking to higher levels of cognitive demand
- Lesson development is truly collaborative in nature
- Scientists provide guidance on the unit's scientific content

*Research base:
Lesson Study*

Lesson Delivery and Observation Phase (Day 2)

- The teacher carries out the lesson according to the team lesson plan
- Observers focus on observing students and collecting data
- Observers maintain the integrity of their role as observers

*Research base:
Professional Learning Communities*

Individual Reflection Phase (Day 2)

- Teachers reflect on the student experience observed by honestly asking themselves, "Was it evident that the students gained a deeper understanding of the big idea addressed?"

Team Debriefing Phase (Day 2)

- Debriefing focuses on a discussion of the evidence of student learning observed that relates to the big idea
- Discussion maintains focus on student learning rather than student actions

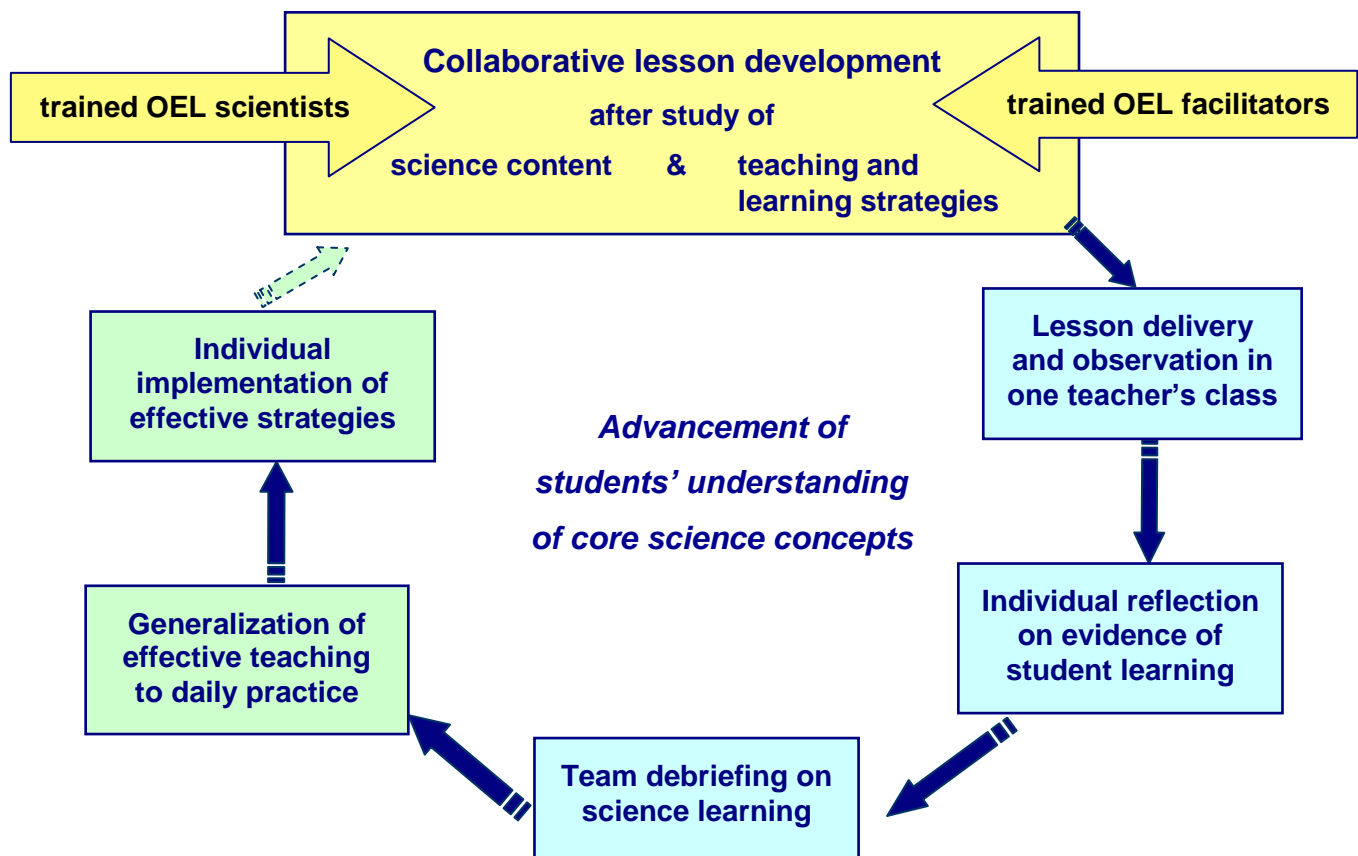
Collaborative Generalization to Practice Phase (Day 2)

- Teachers make connections between the student learning and successful aspects of the lesson design
- Teachers make connections between instructional strategies used in the lesson and student learning
- Teachers make generalizations about how effective strategies can be applied to future lessons

*Research base:
Teacher Professional Growth*

Individual Implementation (On-going Improvements in Practice)

- Teachers consider successful teaching and learning strategies for their own lesson planning
- Teachers enact effective strategies in their own classroom





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National Science Foundation Research Grant: Findings

Observing for Evidence of Learning PURPOSE is enacting learning theory in all science classrooms.



How People Learn
National Academy Press 2004

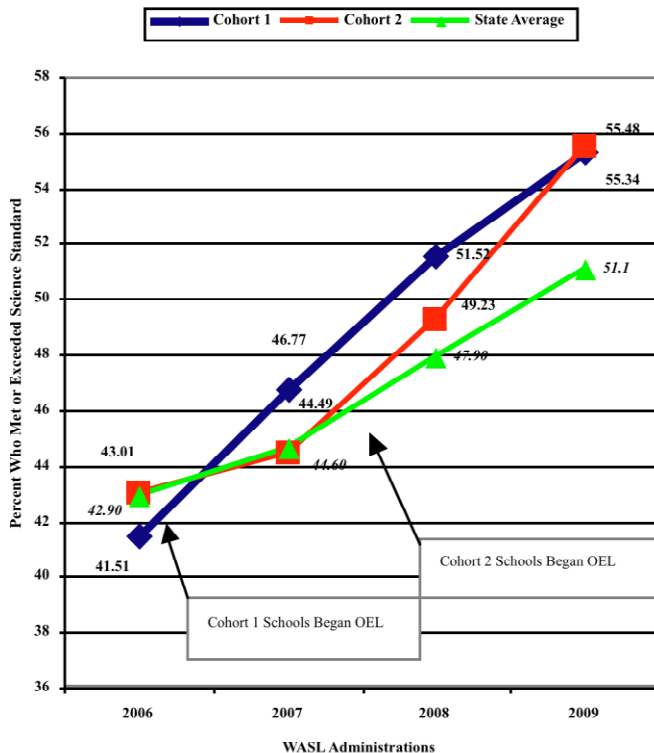


Observing for Evidence of Learning PROCESS is implementing the “Essential Elements” with fidelity (next page).

Observing for Evidence of Learning OUTCOMES are teaching strategies that have been proven to deepen student learning of fundamental science concepts.

To what extent does participation in OEL professional development result in improved student science achievement in grades 6-8?

Adjusted Means on the Grade 8 Science WASL



What impact does OEL have on the teaching practices of participating teachers?

1. Improved teaching strategies are reported by teachers

- 90% teachers surveyed reported that OEL phases improved their efficacy as a teacher.
- 98% reported that developing lessons with peers provided new strategies to use in their own classrooms.
- 90% reported OEL gave them useful strategies for addressing common misconceptions, helped them understand the science content better, and helped them identify the big ideas that form the basis for each lesson.
- 81% reported their lessons were more cognitively demanding as a result of their participation in OEL.

2. Generalizations to Practice emerged in OEL for teachers to implement in other unit lessons, other grade levels, and other science disciplines

~240 two-day cycles to date from four districts' twenty five schools.
Generalizations to Practice fall into three categories of the *How People Learn* key findings:

1. Building on students' prior knowledge
ex: "Purposely focus the students on their evidence to help them overcome misconceptions; e.g. reach consensus in their small groups to stimulate class discussion with arguments supported by evidence."
2. Guiding students to form more sophisticated conceptual frameworks
ex: "Students produce a making-meaning chart to guide them to link and synthesize small parts (from separate lab investigations) into the key science concept of the unit."
3. Student employ metacognitive strategies to assess their learning
ex: "Students make a scientific diagram to show the concept and evidence for their newer and deeper understanding. In science notebooks, place final diagram near the original pre-lab diagram for students to reflect on their new thinking."

3. Lessons improved in OEL are shared

A web site was formed so all teachers can submit and access the lessons improved by OEL.

Note. Mean values adjusted for percentage free or reduced-price lunch and percent minority. Mean values weighted by the number of students assessed. A total of 5173 students were assessed in 2006, 5040 were assessed in 2007, 5014 were assessed in 2008, and 5062 in 2009. Italics denotes state average.