CREATE
Center for Research on the
Educational Achievement and Teaching
of English Language Learners

Making Standards-based Lessons Understandable for English Learners: The SIOP Model

(Sheltered Instruction Observation Protocol)

Jana Echevarria, Ph.D.

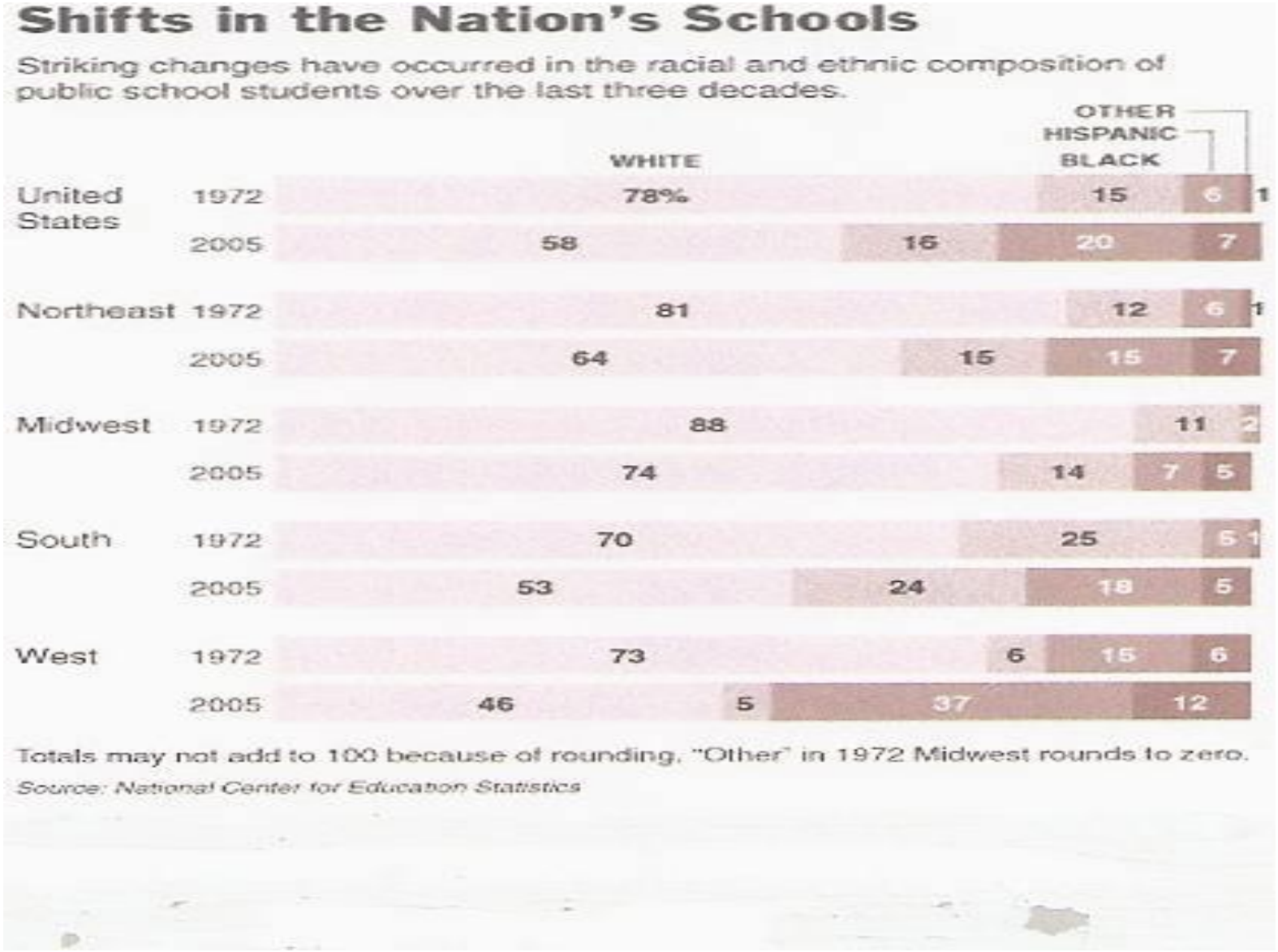
Welcome and Housekeeping

- Discussion/Interactive Format
  - Quick Polling
  - Type messages into chat area
  - Break for responding to chat questions/comments
  - Those on just the teleconference can email questions to: eventquestion@wested.org

Quick Poll: Who is online?

- elementary school teacher
- secondary school teacher
- school, district, or state administrator
- curriculum coordinator
- staff development specialist/trainer
- post-secondary educator or administrator
- researcher
- other

Demographic Shifts

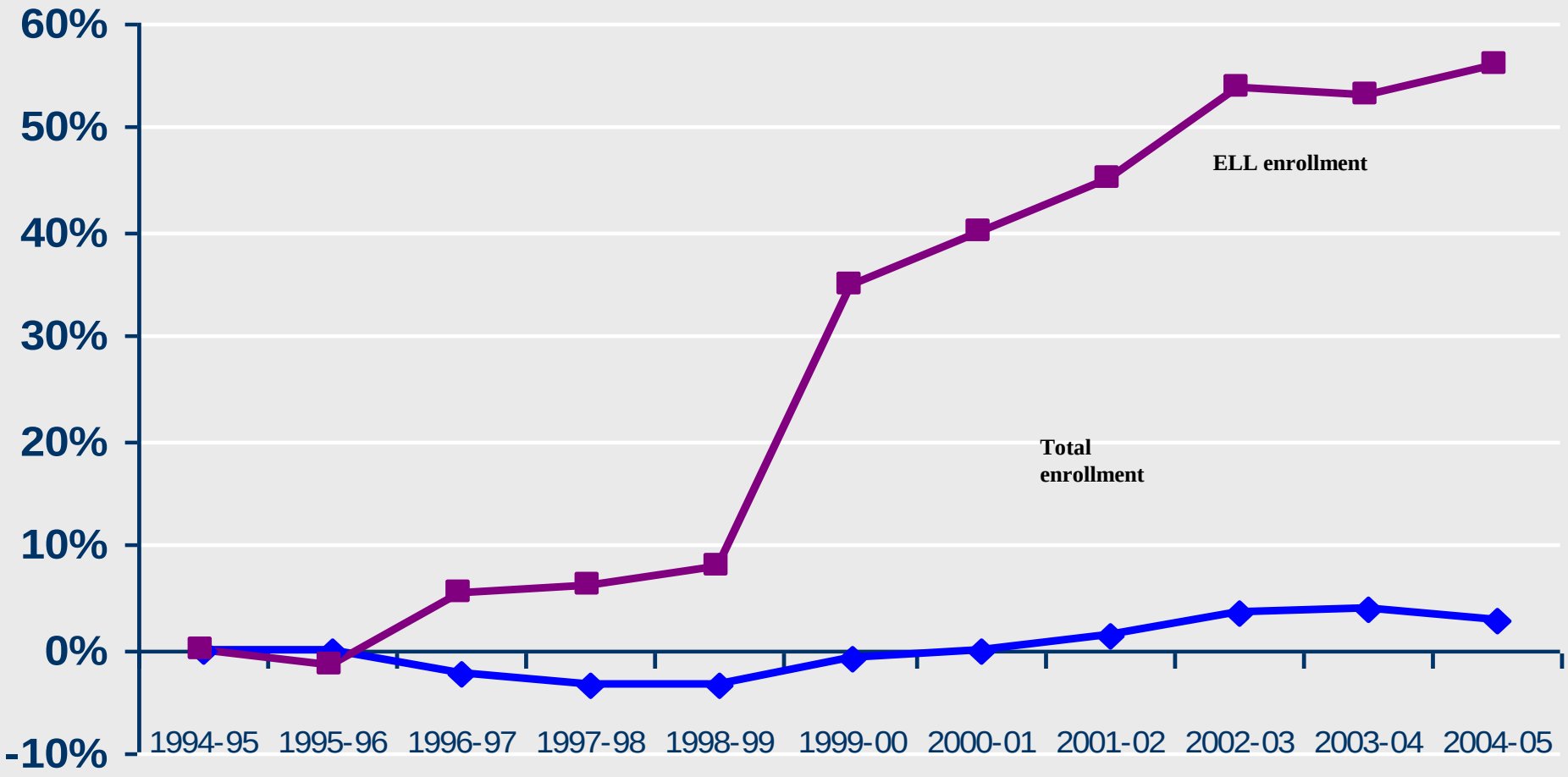


Demographic Shifts

- Population of minority students in 2005 was 42 percent of public school enrollment, up from 22 percent three decades before.

English Learners: The Fastest-Growing Population in U.S. Schools

Rate of Total K–12 and EL Enrollment Growth, 1995-2005



Source*: National Clearinghouse for English Language Acquisition (NCELA)*

The Challenge

- Persistent gap in academic achievement between Caucasian students and those from culturally and linguistically diverse groups:
  - Many teachers are underprepared to make content comprehensible for ELLs.
  - Few teachers trained to teach initial literacy or content-area literacy to secondary ELLs.
  - ELLs are tested in mathematics and reading under No Child Left Behind; and in 2007-08, **tests in science** have been added to the battery of assessments they must take.

The Challenge (con't)

- Most ELLs need 4-7 years to learn English before they reach average academic performance levels.
- As ELLs, they are by definition not proficient.
- But they are tested before they are proficient in English.

Open Response : What Do You Think Teachers Need To Help Close the Gap?

- Type a quick response into the this form and submit

What Do Teachers Need To Help Close the Gap?

- Teachers need to incorporate both language and content objectives into their ESL and science lessons to promote academic literacy.
- Teachers need instructional strategies that can reduce the achievement gap between ELLs and native English-speaking students.

Historical Definition of Sheltered Instruction

A variety of strategies, techniques, and materials specially designed to provide students access to grade-level core curriculum in English.

Research Definition of Sheltered Instruction

A means for making grade-level academic content (e.g., science, social studies, math) more accessible for English language learners while at the same time promoting their English language development.

Echevarria, J., Vogt, M.E., & Short, D. (2008). *Making content comprehensible to English learners: The SIOP model.* Boston: Pearson/Allyn and Bacon.

The Effects of Sheltered Instruction on the Achievement of LEP Students

- CREDE (Center for Research on Education, Diversity & Excellence)
- 7-year research study (1996-2003), funded by the US Dept. of Education
- Teacher-researcher collaboration for SIOP model development
- Field-testing of professional development model
- Studied effect on student achievement

Academic Language Development

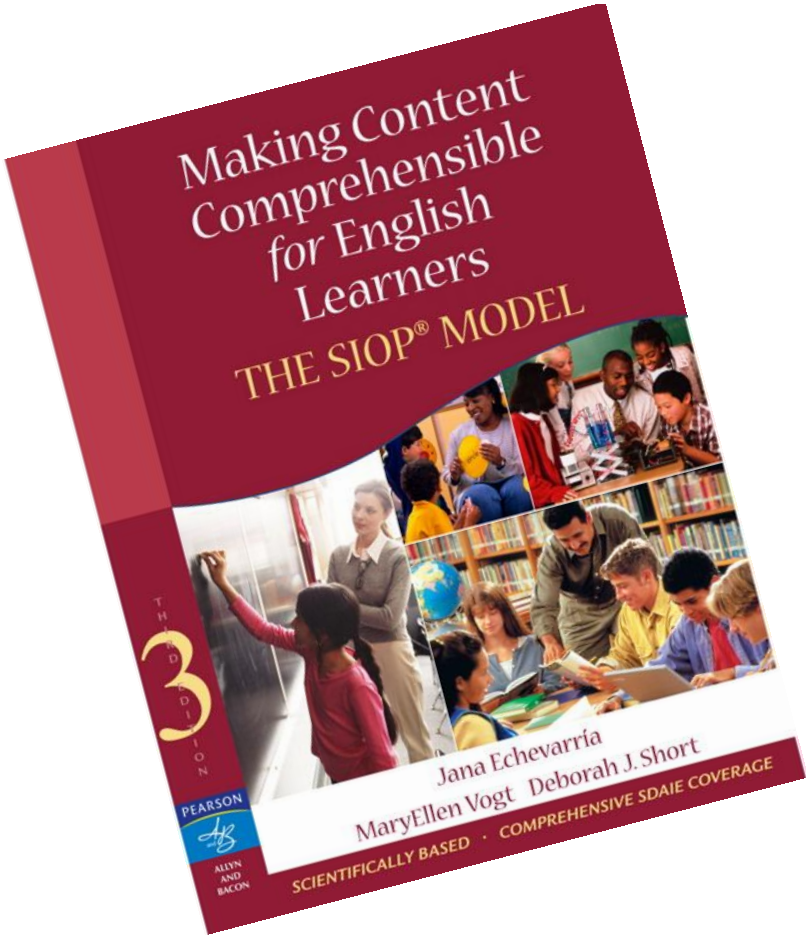
- The complexity of learning a new language and learning through a new language requires more than ESL support.
- Attention to academic language is needed in every content area throughout the day.
- The SIOP Model provides a systematic approach for making content accessible and for consistently focusing on academic language.

Quick Poll: Are you familiar with the SIOP Model ?

- Yes
- No

The SIOP Model

(Echevarria, Vogt, & Short, 2008)



- Preparation
- Building Background
- Comprehensible Input
- Strategies
- Interaction
- Practice & Application
- Lesson Delivery
- Review & Assessment

Components of The SIOP Model
(Echevarria, Vogt, & Short, 2004, 2008)

- **Preparation – language and content objectives**
- **Building Background – vocabulary development, student connections**
- **Comprehensible Input – ESL techniques**
- **Strategies – metacognitive and cognitive strategies**

Components of The SIOP Model

(Echevarria, Vogt, & Short, 2004, 2008)

- **Interaction – oral language**
- **Practice & Application – practice all 4 language skills**
- **Lesson Delivery – meet objectives**
- **Review & Assessment – review vocabulary and concepts**

The SIOP Model

- Shares many features recommended for high quality instruction for all students, such as:
  - cooperative learning
  - strategies for reading comprehension
  - emphasis on the writing process
  - differentiated instruction.
- Accommodates the distinct second language development needs of ELLs.

The SIOP Model

- Contains key features for the academic success of ELLs, such as the:
  - inclusion of language objectives in every lesson
  - development of background knowledge
  - acquisition of content-related vocabulary
  - emphasis on academic literacy practice.

- Allows for some variation in classroom implementation.

The SIOP Model: Application and Use

The SIOP Model is:

- An observation protocol (rating instrument)
- A lesson planning and delivery system

The Sheltered Instruction Observation Protocol (SIOP®)

Observer(s): _____ Teacher: _____
Date: _____ School: _____
Grade: _____ Class/Topic: _____
ESL Level: _____ Lesson: Multi-day Single-day *(circle one)*

Total Points Possible: 120 (Subtract 4 points for each NA given: _____)
Total Points Earned: _____ Percentage Score: _____

Directions: *Circle the number that best reflects what you observe in a sheltered lesson. You may give a score from 0-4 (or NA on selected items). Cite under "Comments" specific examples of the behaviors observed.*

LESSON PREPARATION

4	3	2	1	0
1. **Content objectives** clearly defined, displayed, and reviewed with students		**Content objectives** for students implied		No clearly defined **content objectives** for students

Comments:

4	3	2	1	0
2. **Language objectives** clearly defined, displayed, and reviewed with students		**Language objectives** for students implied		No clearly defined **language objectives** for students

Comments:

4	3	2	1	0
3. **Content concepts** appropriate for age and educational background level of students		**Content concepts** somewhat appropriate for age and educational background level of students		**Content concepts** inappropriate for age and educational background level of students

Comments:

4	3	2	1	0
4. **Supplementary materials** used to a high degree, making the lesson clear and meaningful (e.g., computer programs, graphs, models, visuals)		Some use of **supplementary materials**		No use of **supplementary materials**

4	3	2	1	0	NA
5. **Adaptation of content** (e.g., text, assignment) to all levels of student proficiency *Comments:*		Some **adaptation of content** to all levels of student proficiency		No significant **adaptation of content** to all levels of student proficiency	

4	3	2	1	0
6. **Meaningful activities** that integrate lesson concepts (e.g., interviews, letter writing, simulations, models) with language practice opportunities for reading, writing, listening, and/or speaking *Comments:*		**Meaningful activities** that integrate lesson concepts, but provide few language practice opportunities for reading, writing, listening, and/or speaking		No **meaningful activities** that integrate lesson concepts with language practice

BUILDING BACKGROUND

4	3	2	1	0	NA
7. **Concepts explicitly linked** to students' background experiences *Comments:*		**Concepts loosely linked** to students' background experiences		**Concepts not explicitly linked** to students' background experiences	

4	3	2	1	0
8. **Links explicitly made** between past learning and new concepts *Comments:*		**Few links made** between past learning and new concepts		**No links made** between past learning and new concepts

4	3	2	1	0
9. **Key vocabulary** emphasized (e.g., introduced, written, repeated, and highlighted for students to see) *Comments:*		**Key vocabulary** introduced, but not emphasized		**Key vocabulary** not introduced or emphasized

Applications of the SIOP Rating Instrument

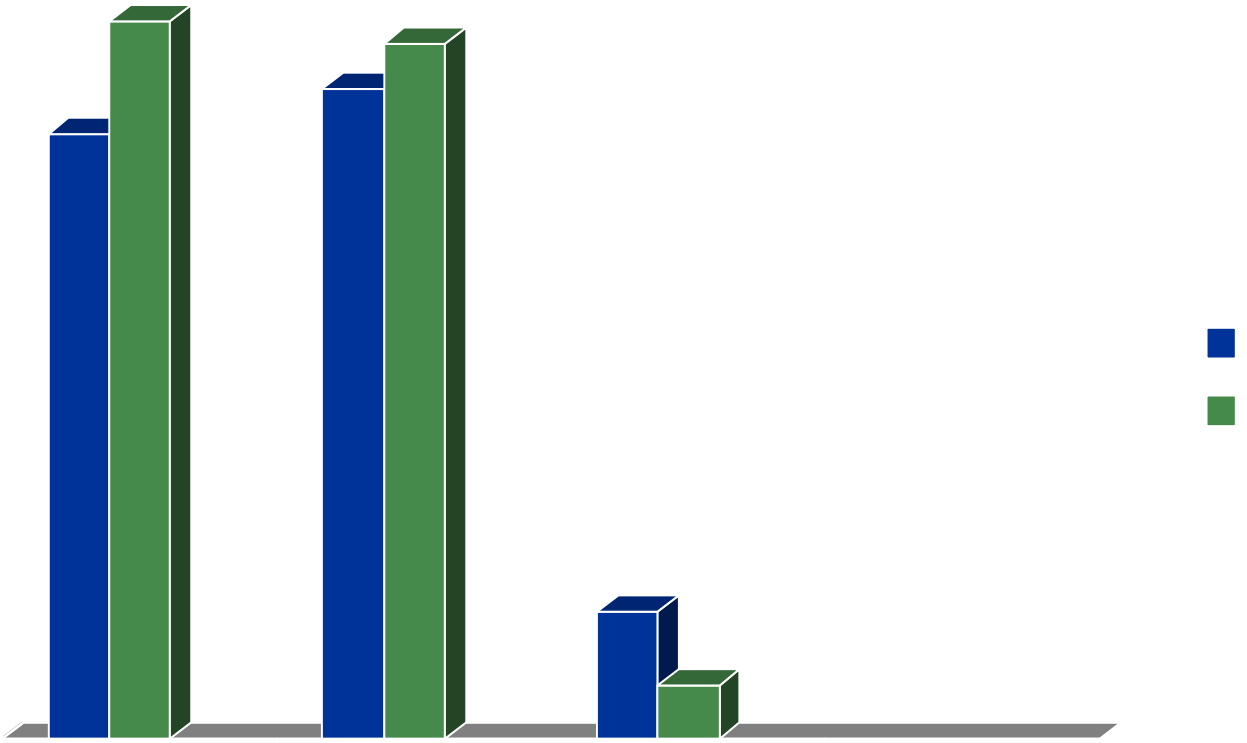
- Research observation tool for fidelity of model implementation
- Supervision and observation tool of student teachers
- Classroom observation tool by administrators
- Teacher self-reflection tool
- Lesson plan checklist

Major Research Finding

- 1998-99: Using a prompt requiring *expository writing,* ELLs in classes with SIOP-trained teachers outperformed and made greater overall gains on the IMAGE test* than ELLs in classes with non-SIOP-trained sheltered teachers (Echevarria, Short, & Powers, 2006).

* Illinois Measure of Annual Growth in English

1998-99 Pre/Post Writing Skills Scores on the IMAGE Test



SIOP Research Reference

Used Widely in Schools

- Currently used widely in all 50 states in the U.S.
- Used in a number of countries around the world.
- Implementation has outpaced research.

Break To Review Chat Comments/Questions

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SIOP Science Research Project

The Impact of the SIOP Model on Middle School Science and Language Learning

The Impact of the SIOP Model on Middle School Science and Language Learning

- A 5-year study (2005-2010) conducted by Center for Applied Linguistics, California State University, Long Beach, and University of Houston supported by IES, U.S. Dept. of Ed.
- Uses a randomized experimental design to investigate the impact of the SIOP Model on student academic achievement in middle school science.
- SIOP professional development, lesson plans, and science language assessments.

Research Questions

1. What are the effects of the SIOP Model of sheltered instruction on academic language and concept comprehension among English language learners in middle school science classrooms?

2. What are the effects of an integrated SIOP Model of sheltered instruction on academic language and concept comprehension among English language learners in middle school science classrooms?

Hypotheses

- Students of teachers trained in the SIOP Model will outperform students of teachers not trained in the model on measures of Grade 7 science content and scientific language.
- Teachers who receive SIOP training in the model plus project-developed SIOP science curriculum units will implement the model to a higher degree than teachers who receive training alone.
- The students of teachers with SIOP training + SIOP science lessons will perform better than students of teachers with training alone.

CREATE SIOP Science Study

Year 1: Pilot study

- Approximately 120 students participated in two districts, Arlington, Virginia and Long Beach, California.
- Pilot designed to:
  1) develop and refine Grade 7 science curriculum lessons that incorporate the SIOP Model features, and
  2) field-test academic science language assessments.

Science Language and Literacy Skills in SIOP Lessons

- Preview, scan, and identify the main ideas in reading passages
- Identify unknown vocabulary words important to understanding a passage
- Define and correctly use new science vocabulary
- Classify or categorize concepts and terms
- Form and write a hypothesis
- Describe and sequence steps in a process
- Summarize findings orally or in writing

Open Response: Can you think of other kinds of language or literacy skills students may need?

Biome Lesson 1

SIOP LESSON PLAN

SUBJECT: Life Science
UNIT FOCUS: Biome

Lesson # 1 **Length of lesson 1 day**

STANDARD(S): Virginia Standards of Learning, Life Science 10) The students will investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem.

LESSON TOPIC: Living Things and the Environment

OBJECTIVES: *write on board*

Language Students will:

- Define new vocabulary visually and in writing

Content Students will:

- Identify and categorize the biotic and abiotic factors in an ecosystem
- Compare and contrast ecosystems, populations, and communities
- Investigate how an organism's habitat is affected by abiotic and biotic factors

KEY VOCABULARY: ecosystem, biotic factors, abiotic factors

MATERIALS: index cards, poster paper

PREPARATION:

1) Post four pieces of poster paper in the corners of the room. Label **hot**, **cold**, **dry**, and **wet**.
2) Ask students to bring in, or have, index cards to make vocabulary cards for each of the key vocabulary terms.

MOTIVATION:
**Post, read, and explain the content and language objectives of this lesson to the students.
"Let's look at our language objectives for today. Students will read language objectives above. Now let's look at our content objectives for today. Students will read content objectives above." Explain the objectives.

Warm Up/Building Background (15 minutes)

- Tell the students to choose a corner and list things found in those environments on the poster paper. Then ask the groups to categorize the things as living or non-living (students could do this by highlighting living things with one color and nonliving things with a different color). Groups select a presenter and that student shares the group's poster. Expand the topic by asking the groups to think and discuss the following questions:
    - What are some areas or regions (in the U.S. or elsewhere) with these characteristics? Have you ever lived in one of these areas?
    - What do these environments have in common? What environments are the most different? Explain.
    - What are some ways you adapt to your environment (jump in the pool when it is hot, turn on the heat in the winter, etc.)
    - What environment is the best to live in? How did you come to this decision?

  Ask groups to share their responses with the whole class and record some of the answers for the class to see.
- Tell the students we are going to learn two new words for "living" and "non-living" today. Introduce *biotic* and *abiotic*.
- Explain, "With each of our key vocabulary words for this chapter, we will be making vocabulary cards that will help us study." Model a vocabulary card--write the word on the front side, write a definition in your own words, draw a picture, and use the word in a sentence on the back. Students develop a vocabulary card for *biotic* and *abiotic*. Write the new words on the board or add to a Word Wall.

PRESENTATION: (10 minutes)

- Read the introductory passage on pp. 16-17 to the students. Check for comprehension throughout and discuss any unknown words.

PRACTICE/APPLICATION (10 minutes)

- Emphasize that all the biotic and abiotic factors that interact in an area form an ecosystem and ask the students to help you make a word web for ecosystem (you may want to help the students get started by asking questions like, "Ok, what was the name of the ecosystem of these prairie dogs?" and "What is the name of the ecosystem where we live?"). Leave the web on the board or overhead for the students to refer to later in the lesson.
- Develop vocabulary card for *ecosystem*. Write the new word on the board or add to a Word Wall.

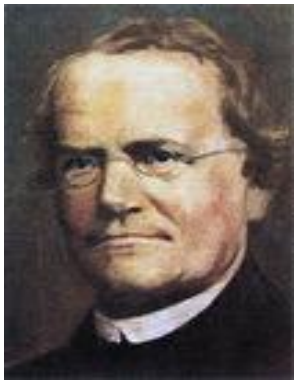
REVIEW/ASSESSMENT: (5 minutes)

- Students write two things they learned in the lesson and one question they still have on the Exit Sheet for today's lesson.
- Review objectives. "Let's see if we met our language objectives for today. Students will (read language objectives above). Now let's see if we met our content objectives for today. Students will (read content objectives above)." Discuss if met or not and why/how.

Science Language Assessments

- Aligned to national science and TESOL standards.
- Test items informed by the World-class Instructional Design and Assessment (WIDA) English Language Proficiency *Access for ELLs®* test.
- Test tasks adapted from research by the National Center for Research on Evaluation, Standards, and Student Testing (CRESST).

Key Features of Science Language Assessments



- Assessment of reading and writing ability
- Graphic support and bolded key words
- Text elaboration and simplification
- Items range in levels of difficulty
- Short and extended written responses
- Knowledge of the language of science necessary to answer test items

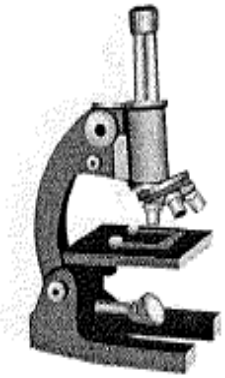
Cell Structure and Function

Part I. Read the passage below and then answer the questions.

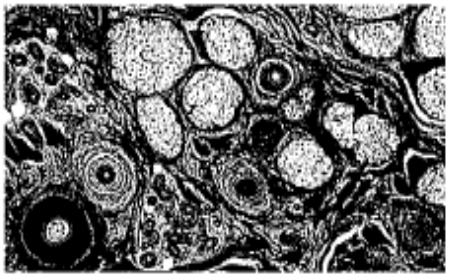
Cells are the basic units of structure and function in living things. We know about them because after the **microscope** was invented in 1590, scientists could see cells. **Cell theory** explains the relationship between cells and living things. Cell theory tells us the following:

a) All living things are made of cells.
b) Cells are the basic unit of structure and function in living things.
c) All cells are produced from other cells.

Cell theory applies to all living things, from the simplest to the most complex organism.



Microscope

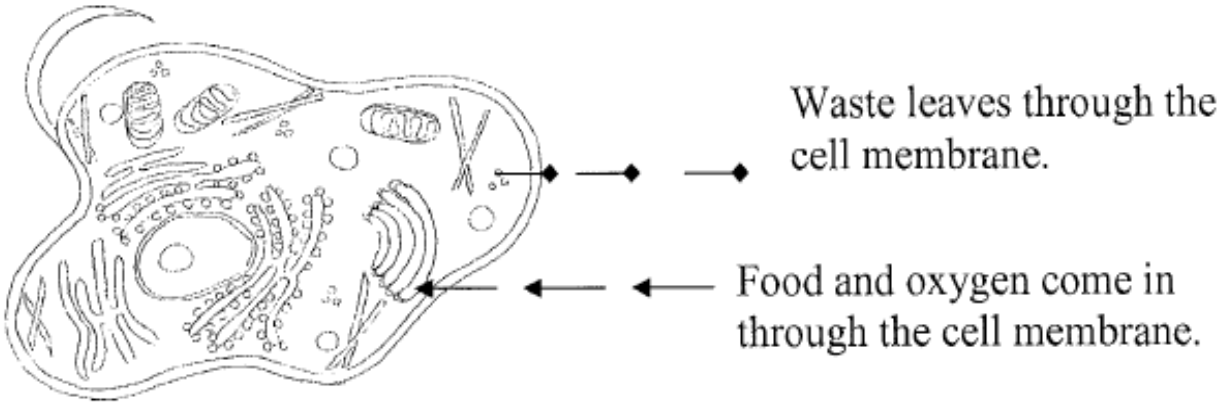


Skin Cells

(Source: http://www.dorlingkindersley-uk.co.uk/static/cs/uk/11/clipart/humanbody/img/image_body004.jpg)
(Source: http://www.celltechpersonalcare.com/skintelligence/skin_health.jsp)

Animal cells have many parts with different jobs. The most important part of an animal cell is the **nucleus**. It acts as a cell's 'brain' or 'control center,' because the nucleus directs all of the cell's activities. The nucleus is surrounded by a **nuclear membrane**. The nuclear membrane has many pores, which are tiny openings. The membrane protects the nucleus by allowing only certain materials to pass in and out through the pores. **Chromatin** are inside the nucleus. They are strands of genetic material that contain the instructions to direct the functions of a cell. The nucleus also contains the **nucleolus**. The nucleolus produces **ribosomes**.

Another part of an animal cell is the **cell membrane**. It surrounds an animal cell. The membrane also has many pores to control what passes in and out of the cell. The cell membrane lets **oxygen** and food into the cell and lets harmful waste products out.



Cell Membrane at Work

(Source: http://www.biologycorner.com)

II. Match the organelles with their functions. Write the letter of the organelle next to its function.

A. Endoplasmic Reticulum
B. Vacuoles
C. Nuclear membrane
D. Lysosomes
E. Golgi bodies

____ They receive, put together, and distribute materials within the cell.

____ They stock food, water, and waste products.

____ They break down food, recycle waste, and old cell parts.

____ They transport materials within the cell.

III. Complete each sentence with one of the words in the list. Use each word only once.

nucleus	cell membrane	chromatin
mitochondria	nucleolus	ribosomes

1. The _____ is the part in the nucleus where proteins are produced.
2. The _____ controls all the activities of the cell.
3. _____ produce most of the cell's energy.

VIII. Write an answer to the following question.

Mark has blue eyes, but both his biological parents have brown eyes. Based on all the information you read about genetics, explain how this can happen. Write as much as you can. Use scientific terms.

Writing Rubric - IMAGE

- A five point scale that assesses student writing in five categories:
  - language production
  - focus
  - support/elaboration
  - organization
  - mechanics
- Inter-rater reliability established between 2 raters.

Break To Review Chat Comments/Questions

Year 2 SIOP Science Study

- Experimental Design
- 8 Middle Schools
  - 5 SIOP
  - 3 comparison
- 7th grade science classes
- SIOP teachers received 2 ½ day training and lesson plans for 4 units
- Students were administered pre and post assessments

Project Activities

- Develop SIOP science units for Grade 7 (Cell Structure/Function, Cell Division, Photosynthesis/Respiration, and Genetics)
- Develop science language assessments
- Train intervention teachers
- Provide coaching to intervention teachers
- Compare data with control teachers

Year 2 Student Participants

	SIOP Classes	Control Classes	Totals
ELL	105	112	217
FEP (≤ 3 years)	212	121	333
FEP (> 3 years)	89	20	119
English only	243	109	352
Totals	649	372	1021

Year 3

- 12 schools will participate as Treatment 1, Treatment 2, or Control sites.

  - Treatment 1 teachers will receive SIOP training, SIOP lessons, and coaching.

  - Treatment 2 teachers will receive SIOP training and coaching.

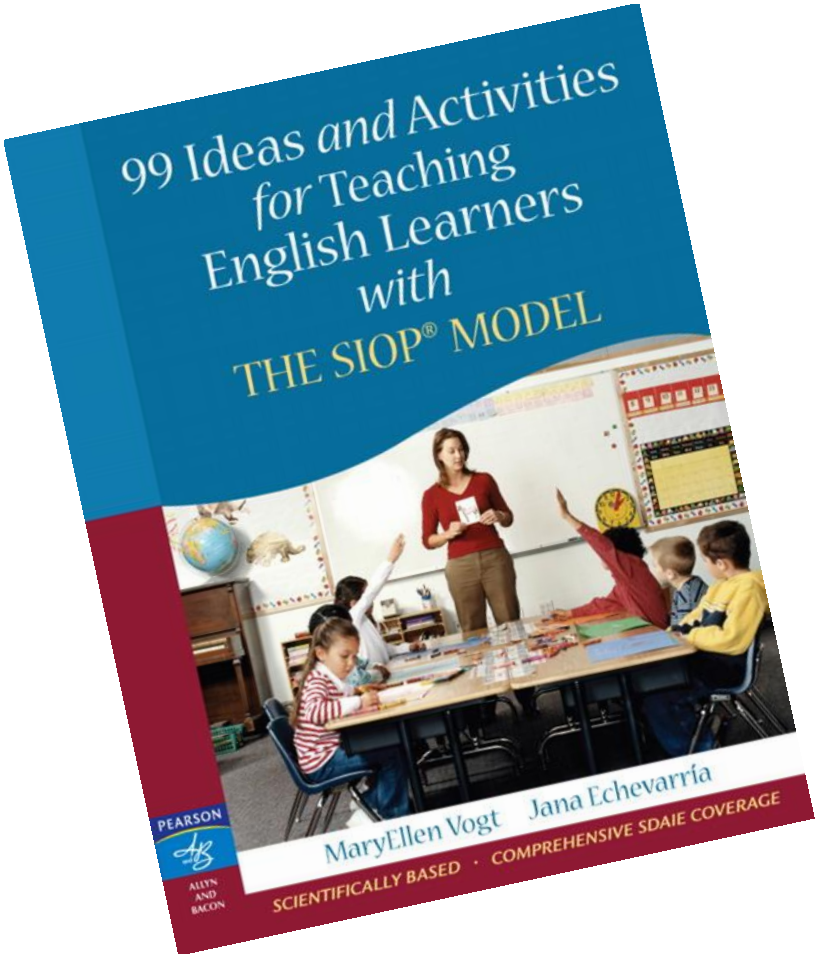
- Control teachers conduct business as usual with data collection.

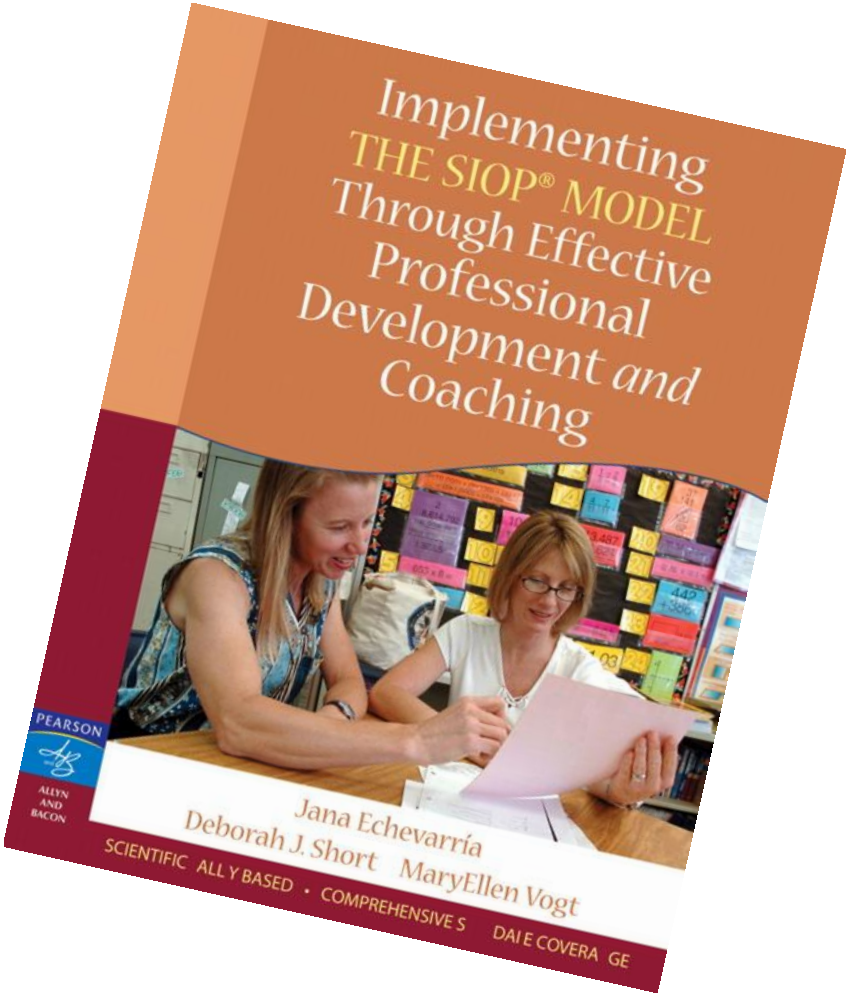
Years 4-5

- Data gathered from Years 1-3 will be combined with the research findings from other CREATE research studies and will tested as a school reform intervention for ELLs.

Next Steps

- Implementation





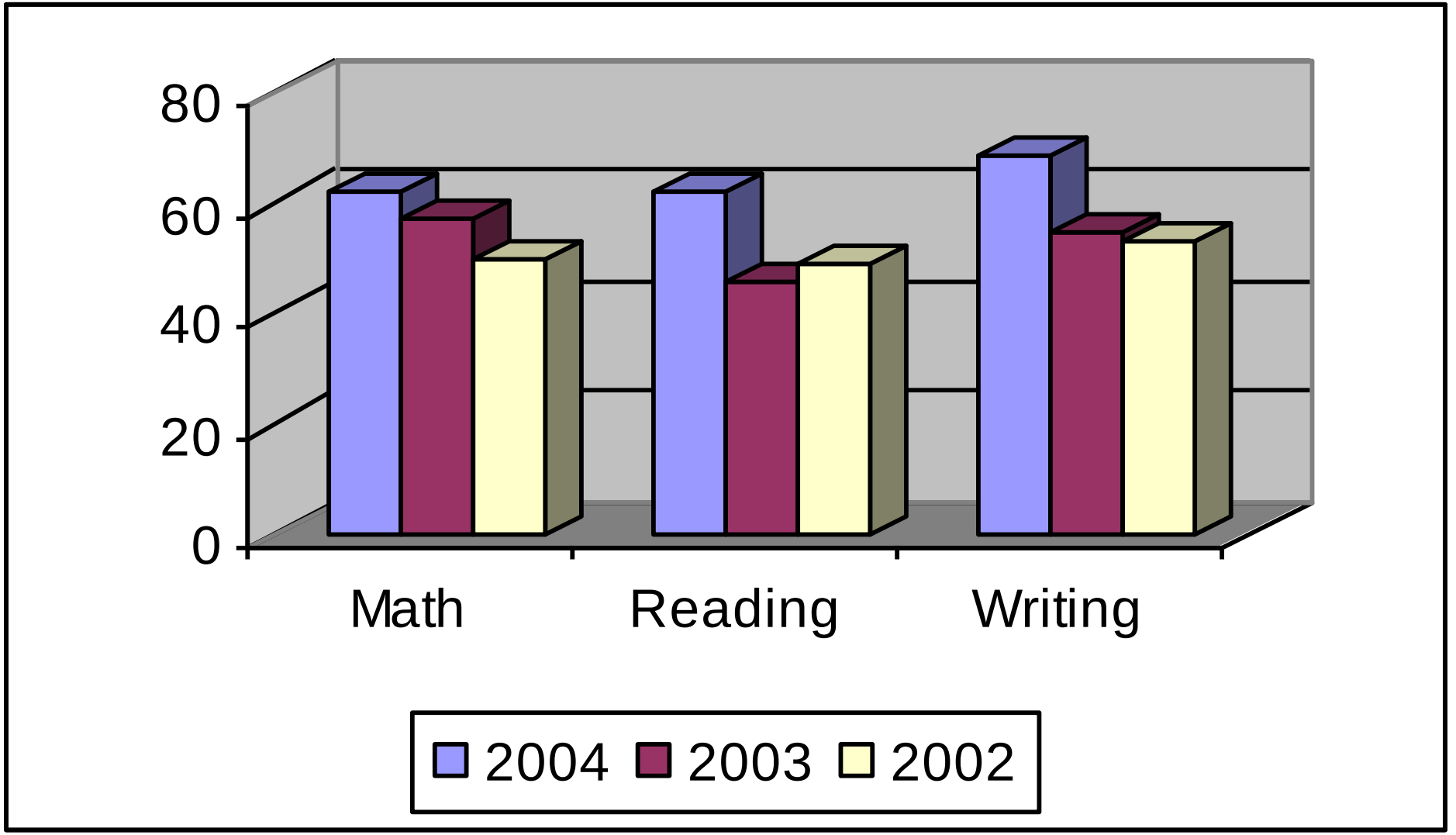
School-based Results

Lela Alston Elementary School

Phoenix, AZ

Lela Alston Demographics

- Lela Alston School demographics:
  - 450 students
  - 97% free/reduced lunch
  - High mobility
  - 74% LEP
  - 10% identified as special education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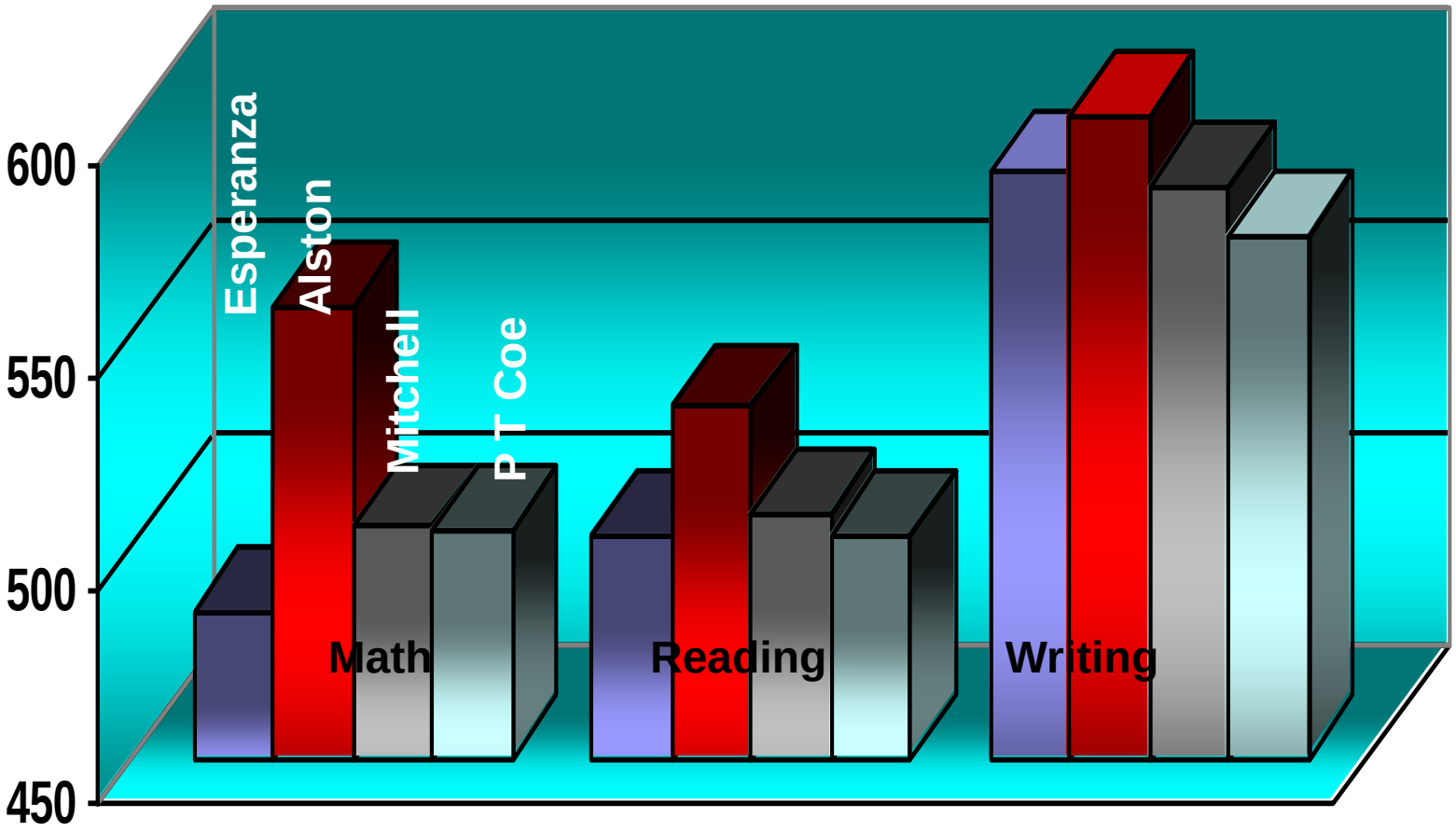
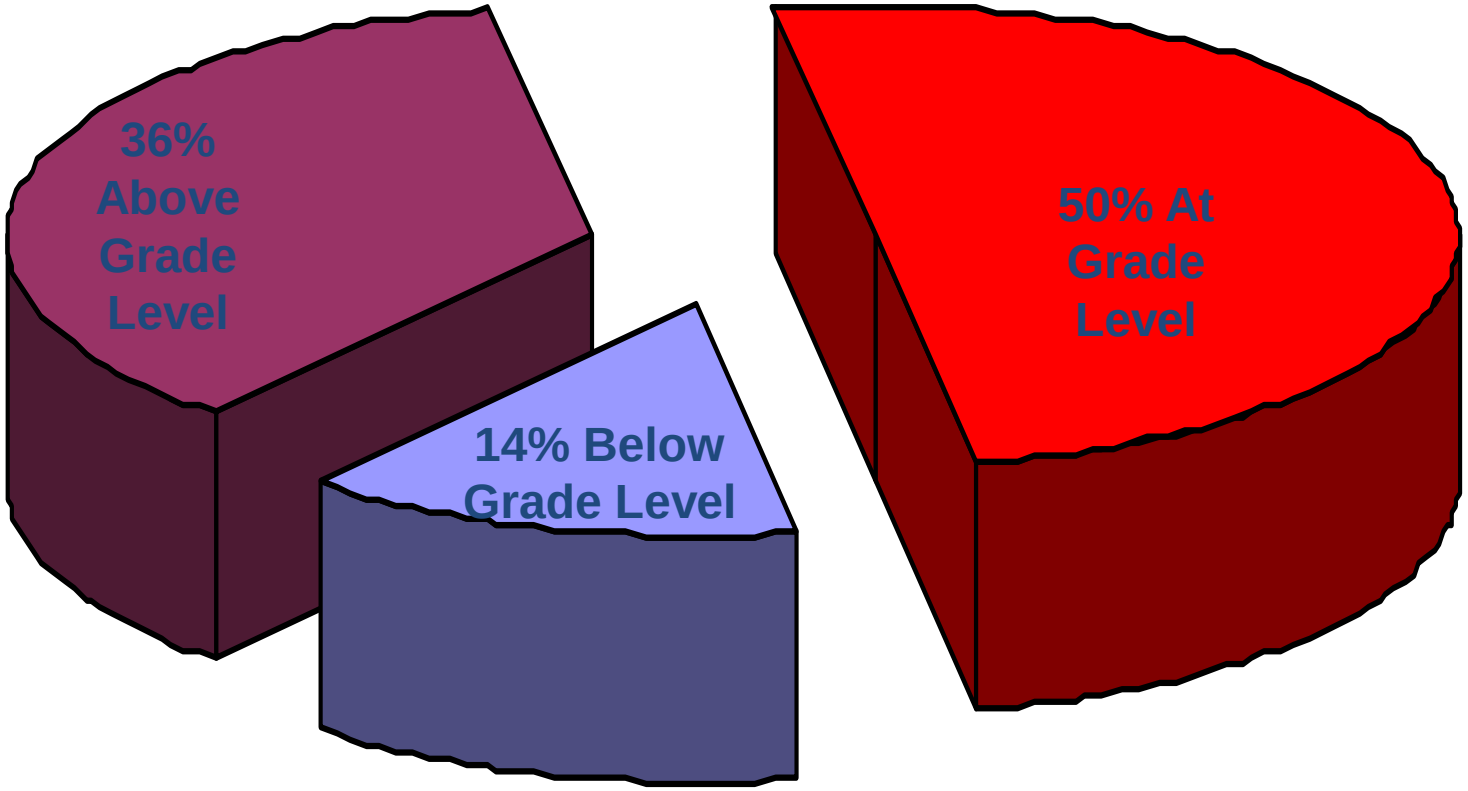
60
40
20
0
Math
Reading
Writing
2004
2003
2002

Arizona's Instrument to Measure Standards
Spring 2004 Grade 3 – Alston School



Mean Standard Score – Arizona Department of Education

Off To A Good Start



The SIOP Model Today

- Research tool for measuring level of implementation and fidelity
- Lesson plan and delivery system
- Comprehensive professional development program
  - Videos
  - Additional books
  - SIOP Model digest series
- SIOP Institutes
- District-level SIOP trainings

Open Response: Final Comments/ Questions

- Please type into this form any final questions or comments

For more information

On the SIOP Model, see www.siopinstitute.net

On the SIOP science research project, see www.cal.org/projects/create.html

Research Reports, Books, & Articles

- Echevarria, J. (2006). Helping English language learners succeed. *Principal Leadership,*
  6(5) 16–21.

  This article provides administrators with an overview of effective instructional practices for English learners and emphasizes the importance of sustained professional development in meeting students' needs.

- Echevarria, J., & Colburn, A. (2005). Designing lessons: An inquiry approach to science using the SIOP Model. In A. Fathman & D. Crowther (Eds.), *Science for English language learners* (pp. 95–108). Arlington, VA: National Science Teachers Association Press.

  This chapter presents overviews of inquiry science and the SIOP Model with sample SIOP
  science lessons and commentary that helps the readers understand how inquiry and the SIOP Model can work together.

- Echevarria, J., & Graves, A. (2007). *Sheltered content instruction: Teaching English learners with diverse abilities* (3rd ed.). Boston: Allyn & Bacon.

  This book is a comprehensive resource for teaching English learners, particularly those struggling learners and students with disabilities.

- Echevarria, J., & Short, D. (2004). Using multiple perspectives in observations of diverse classrooms: The Sheltered Instruction Observation Protocol (SIOP). In H. Waxman,
  R. Tharp, & S. Hillberg (Eds.), *Observational research in the U.S. classrooms: New approaches for understanding cultural and linguistic diversity* (pp. 21–47). Boston:
  Cambridge University Press.

  This chapter discusses the characteristics of effective sheltered instruction (SI) for English learners and introduces a research-based model of sheltered instruction, known as the SIOP Model. It presents ways that the SIOP instrument was used to observe and document teachers' implementation of the Model in diverse classrooms.

- Echevarria, J., Short, D., & Powers, K. (2006). School reform and standards-based
  education: An instructional model for English language learners. *Journal of Educational Research, 99*(4) 195–210.

  This article presents the research findings on student achievement from the CREDE study. This study examined the effects of the SIOP Model on the academic literacy development of English learners and showed that students with SIOP-trained teachers performed significantly better than the comparison group.

- Short, D. (2002). Language learning in sheltered social studies classes. *TESOL Journal, (11)*1, 18–24.
  This article presents findings of a discourse analysis research study on teacher talk in sheltered social studies classrooms and calls for teachers to implement features found in the SIOP Model to strengthen student development of academic literacy skills.

- Short, D., & Echevarria, J. (2004/2005). Teacher skills to support English language learners. *Educational Leadership, 62*(4), 8–13.
  This article describes the SIOP Model and its application through a variety of techniques and skills teachers can use. Profiles of different English learners also show the diversity in our classrooms.

- Short, D. & Their, M. (2005). Perspectives on teaching and integrating English as a second language and science. In A. Fathman & D. Crowther (Eds.), *Science for English language learners* (pp. 199–219). Arlington, VA: National Science Teachers Association Press.
  This chapter provides the rationale for integrating language development and ESL methods with science education. The SIOP Model is explained as an example of an approach that meets science standards while helping English learners with communicating science concepts.

- Vogt, M. E. (2005). Improving achievement for ELLs through sheltered instruction. *Language Learner, 1*(1), 22–25.
  This article argues that elementary and secondary content teachers must be prepared to
  develop English learners' content knowledge and English language proficiency consistently
  and systematically through effective sheltered instruction.

Professional Development Products

The following products are available at www.siopinstitute.net and www.cal.org.

- Echevarria, J., Vogt, M. E., & Short, D. (2008). *Making content comprehensible for English learners: The SIOP® Model* (3rd ed.). Boston: Pearson Allyn and Bacon.

  This book describes the SIOP Model in detail for teachers and administrators. The theoretical and research backgrounds of the thirty features are discussed and vignettes of teachers implementing the SIOP Model in a range of subject areas across the three school levels (elementary, middle and high) are provided. Readers learn how to use the SIOP rating scale for observation, coaching, and evaluating teacher implementation of the Model.

- Echevarria, J., Vogt, M. E., & Short, D. (2008). *Implementing the SIOP® Model through Effective Professional Development and Coaching*. Boston: Allyn and Bacon.

- Hudec, J. & Short, D. (2002). *Helping English learners succeed: An overview of the SIOP model.* DVD and Video. Washington, DC: Center for Applied Linguistics.

- Hudec, J. & Short, D. (2002). *The SIOP model: Sheltered instruction for academic achievement.* DVD and Video. Washington, DC: Center for Applied Linguistics.

- Short, D. (2000). What principals should know about sheltered instruction for English language learners. *NASSP Bulletin, 84*(619), 17–27.

  This article describes the SIOP Model and helps administrators recognize characteristics of high-quality sheltered instruction in their schools.
- Short, D., Echevarria, J., & Vogt, M. E. (2008). *The SIOP® Model for Administrators.* Boston: Allyn and Bacon.
- Vogt, M. E., & Echevarria, J. (2008). *99 ideas and activities for teaching English learners with the SIOP Model.* Boston: Pearson Allyn and Bacon.

  This resource handbook for SIOP-trained teachers offers many classroom-tested and research-based instructional approaches that support the SIOP Model. These activities promote English language practice among students and develop their content knowledge and literacy proficiency.

Next Steps: Archive & Feedback

- http://www.schoolsmovingup.net/events/siop
- http://www.schoolsmovingup.net/events/siop/survey.htm