

# **100+ SIOP Science Content Classroom Modifications for ELLs: Strategies for teaching low-level students using 8 SIOP components regarding assignments, in-class work and testing**

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## **I. Preparation: In advance of class**

1. **Assign specific scientific readings** in a simplified book or **find low-level scientific books with a lot of visuals** for students to read for comprehension. Put them on old in the library.
2. Search for **specific scientific readings on school websites in native language** or compile a handy list of relevant **scientific websites** for students to access in English.
3. Ask students to buy a **scientific dictionary in their native language** or make copies from one for them.
4. Ask students to **label scientific models or diagrams, posters, etc.**
5. **Borrow science materials on that unit from the ESL teacher or native language teacher (Ex: Spanish or French teacher).**
6. Contact a **large school system (Ex: Florida or California)** and see what **print scientific native language materials** they have.
7. See what **native language audio materials or supplements** are available in your district from other teachers.
8. Encourage students with Romance language backgrounds to **infer meaning of scientific words** with a Latin root.
9. Give students an outline of the lesson in advance that highlights the **key scientific concepts and vocabulary.**
10. Give students the reading assignments, vocabulary (**especially difficult or unfamiliar scientific words**) or projects in advance so they can prepare for the material to be covered and understand key ideas.
11. **Look in an ESL catalog for science materials.**
12. Make an outline of what you will cover on the board or overhead. An outline before the lesson is helpful and this may be in your teacher' manual already.
13. Provide a CD or audio of the science textbook for students to borrow.
14. Provide an outline of the lesson to students (there may be one in the teacher's manual).
15. Provide graphic organizers in advance. You can fill in basic information for students as an example.
16. Provide **scientific models** of work (**ex: lab reports, flow charts**) and formatting.
17. Put **scientific posters or charts** with basic **scientific concepts** on the wall.
18. Provide students with a list of **key scientific vocabulary words** from a chapter in advance. They can find the words in their bilingual dictionaries.
19. Provide unit themes in advance and students can read them on the web (or in the **native language scientific text supplement**) prior to reading it in class.
20. Provide written directions of assignments in advance.
21. Students can read about the topic in a **native language science book.**
22. Students can read about the topic on the web in a native language **scientific website before class.**
23. **Subscribe to a scientific magazine at a lower-level.** Ex: for high school, buy a middle school or elementary school-level magazine.
24. Use **scientific models** ex: parts of the body, parts of plants.
25. Use simple **scientific readers** as supplements (**ex: National Geographic scientific reader series**)
26. Write **key scientific words** on vocabulary note cards or stickies and keep in the class for students to access.

## **II. Building Background: In class: What students can do:**

1. Allow students to audiotape your classes and transcribe notes at home.

2. Allow students to be expert on a **scientific topic** by providing the topic in advance so they can look it up and be prepared for study or discussion.
3. Allow students to keep a **scientific journal, log or modified lab report** about what you are studying. Permit them to write both in English and use native vocabulary (if they need to).
4. Ask a fluent native speaker to translate directions.
5. Ask students to **copy science textbook chapter, title, subtitles, make a timeline, draw pictures, flow charts or diagrams.**
6. Ask students to explain a **science-related component** from their country. What is the most important animal in Mexico? Why? How is it used? How do they feel about it? Extend the assignment into extra credit or a writing assignment.
7. Ask students to bring in something **science-related from their country** and show you or the class.
8. Ask students to keep a **scientific vocabulary log** in English and if native language if they need to.
9. Ask students to keep a **scientific picture dictionary** in English and if native language if they need to. **They can draw processes, diagrams and flow charts.**
10. Ask students to write down everything you write on the board. Check their notes (you can grade them for completion).
11. Build science background—**don't assume students have even basic scientific knowledge in their native language.**
12. Suggest students **watch science TV shows like "Discovery," "Animal Planet" or "Nova."** Give extra credit if they can watch a show and take notes or summarize content.
13. Give extra credit if they can **watch a science video from the library** and take notes or summarize content.
14. Ask students to **read a science article from the news** and summarize and bring it in. If this is too difficult, **students can bring in a scientific article and highlight 5 new words, translate the words, write the definition and make a sentence.**
15. Ask students to **make a model** of what you are going to be studying and bring it in.
16. Ask students to **bring in a color photo or a magazine article** about something you are going to be studying and bring it in to show the class.
17. Ask learner to do a **miniature science "show and tell"** paired with a higher-level partner.
18. Ask student to **look at a website (maybe elementary level) on your computer** prior to starting an assignment while other students are doing the warm-up.

### III. Comprehensible Input: In class: What Teachers can do

1. Avoid cursive writing since students may not understand it.
2. Explain **jargon and scientific concepts** as simply as possible. Repeat important information often.
3. Explain **classroom terms** by your definition at the beginning of the class. What does note taking mean to you? If it means jotting down words or a formal outline, tell students what you expect of them.
4. Give 20 seconds of wait time when asking students to answer.
5. Paraphrase all directions.
6. Paraphrase objectives for the day in non-academic language.
7. Point to posters or charts as much as possible.
8. Provide additional directions to ELLs before an assignment or ask them to repeat what you are going to do
9. Say something (ex: a page number in the text), write it on the board, point to it and then repeat it. Open the book and point to the page.
10. Tell students what you expect from your classes—have clearly defined rules
11. Use clear body language and gestures.
12. Write assignments and directions in the same spot every time.
13. Write down as much as you can on the board, overhead or using a PowerPoint

- presentation.
14. Write a **Spanish language cognate on the board as a warmup** (flora and fauna) for example, and ask ELL to explain it or draw it.
  15. Show a **video segment of a science video** before studying a new concept.

#### IV. Strategies

1. Always give a study guide to ELLs prior to testing.
2. Don't overwhelm ELLs with too much material at once. Use chunks of material. Scientific material can be especially hard to absorb.
3. Emphasize the **2-3 most important scientific concepts** of a lesson.
4. Emphasize the **5-10 most important ideas in the chapter/unit for testing**.
5. Emphasize the **5-6 most important scientific words** in a lesson.
6. Encourage students to master basic study skills.
7. Ensure even lowest-level students are on task. These students can translate **scientific words, take notes or paraphrase**.
8. Incorporate the core skills. A low-level listener may be a strong reader.
9. Informally assess your ELLs after new content by asking a specific question. Avoid asking, "Do you understand?" They will most likely say, "Yes." Even if they do not.
10. Reduce the number of questions students must answer.
11. Review learning strategies. Remind students to take notes, to summarize, to outline. Teach this and reinforce it.
12. Use **colors** to signal very important terms. Ex: a red word will be on the test.
13. Use computers to type your assignments.
14. Use **highlighters** for students in-class assignments to focus students and reinforce ideas.
15. **Write legibly** and speak clearly when teaching—avoid cursive writing since many ELLs students can't read or write cursive.

#### V. Interaction

1. Ask ELL to **summarize lab assignment after it is complete for a grade**.
2. Ask for parent volunteers to assist in the classroom.
3. Assign the ELL a task in the group (ex: timekeeper or the person who keeps everyone on track).
4. Bring in **science experts** as guest speakers.
5. Emphasize **pronunciation of multisyllabic words. Focus on ELLs' pronunciation as they tend to skip or mispronounce longer words**.
6. Encourage higher level student to correct ELLs' pronunciation.
7. Let ESL students copy someone else' notes or see yours.
8. Pair ELL students with higher-level student who can explain **scientific procedures in the native language**.
9. Place students in triads for group work. When doing **research or lab activities**, carefully partner your student.
10. Play class **games using science vocabulary**. Give ELL the answers.
11. Seat ELLs in the front of the class or near you.
12. Suggest ELLs get **science tutoring**.
13. Suggest ELLs study in groups. Give extra credit for study group work.
14. Use **same-language partner for beginning students when explaining new scientific concepts**.
15. **Watch a mini except from TV or video and ask low-level student and partner to write questions for the class to answer**.

#### VI. Practice/Application

1. Allow students an opportunity to express **key scientific concepts** in their own words.

- Check their understanding using “show me” techniques.
2. Allow students to answer yes or no questions or limited choice questions (is it A, B, or ).
  3. Encourage student to **underline key scientific words** or facts.
  4. Encourage students to build a **notecard file of scientific vocabulary** words or to add to their science vocabulary log.
  5. Encourage students to **draw a word** on a notecard and put the terms on the other side.
  6. Encourage students to learn a new scientific word, **the part of speech, the word family and related words**. Ex: digestion (noun), related words digest, digestible
  7. Encourage students to learn synonyms or related words (genus, species, family).
  8. Give ELLs extended time on assignments.
  9. Give extra credit on grading for work attempted.
  10. Incorporate the core skills (reading, Writing, Listening, Speaking) in your assignments. A low-level listener may be a strong reader.
  11. Keep an assignment book in the class so they can review new assignments or topics.
  12. Keep **key scientific words** on vocabulary note cards.
  13. Let students express **key scientific concepts** in their own words (by journaling or drawing) for example when class material is too challenging.
  14. Reduce the number of tasks which allows students to participate without being overwhelmed. Give ESL students less to do than the mainstream students. Ex: if an assignment is to complete 10 tasks, assign the ESL students five.
  15. Shorten, reduce assignments or extend time for assignments.
  16. Use visuals, like **models, graphs, flowcharts, picture cues, internet materials, videos** as support and real objects to make concepts concrete.
  17. Very low-level students can point, nod, look at charts, pictures, draw or copy material.

#### **VII. In class: Lesson Delivery:**

1. Avoid abbreviations, especially teacher-created definitions. Use standard abbreviations, especially those in a dictionary that students can reference.
2. Avoid **abstract terms, scientific jargon unless absolutely necessary, slang and abbreviations**. Use concrete language and questions.
3. Avoid complex sentences, passive tense, and phrasing in questions such as "except" and "which I not...?"
4. Avoid cultural, sports, religious or slang references. What is your “fairy godmother” or “batting 1000” or “it’ raining cats and dogs.”
5. Avoid passive words, ex. This paper must be formulated “Please write . . .”
6. Avoid phrasal verbs will ask you to come up with
7. Avoid southernisms. “Cut off the lights” is confusing. Please turn off the lights is better.
8. Break down vocabulary into parts of speech.
9. Check for comprehension frequently.
10. Define **critical scientific jargon and state it is jargon**.
11. Define terms, especially technical jargon.
12. Distinguish between academic language and informal spoken language.
13. Include a **model or visual** when giving directions.
14. Make instructions simple and visual. Repeat and rephrase often.
15. Provide both written and aural messages for the same task.
16. Simplify complex tasks. Simplify the language of instruction, not the concept being taught. Simplify: Simplify complex questions.
17. Use basic words. Avoid rubric, grading scale, task, prompt and criteria.
18. Use colors to highlight important ideas (on board or overhead).
19. Use **high frequency scientific words**.
20. Use **scientific vocabulary in context** so students can infer meaning. Use **scientific vocabulary as a warmup**.
21. Use **science word walls and sticky notes** around the classroom. Label items particular to your class.

### VIII. Review/Assessment:

1. Allow students to show comprehension through alternative means.
2. Create a simplified version of the test.
3. Give **student scientific objective tests** (multiple choice, True or false) not essay tests.
4. Give students some objective parts on tests: matching, multiple choice, etc.
5. Make a simplified language or shortened version of the test. Assess ESL students on their effort to understand the content area material at their current level of language ability. Are students trying to participate in class? Are they making progress?
6. Provide highlighted tests.
7. Read test questions aloud. Provide additional testing instructions or rephrase directions.
8. Reduce the number of responses students need to complete. Ex: ask students to complete only odd or even numbered questions. **Circle or highlight necessary parts** of the test students must complete.
9. Simplify test directions.
10. Supply **science word banks** for tests.
11. Obtain **easier scientific tests from elementary texts or use materials from elementary or middle school websites.**
12. Test in **alternate ways (lab reports, demonstrations, journals, oral reports, writing assignments).**
13. Test only key scientific concepts or main ideas (not specific points).