Making Language Visible in Science Instruction

Best Practices for School & District Leaders!
September 15, 2021

ESOL Directors’ Munch & Learn 2021-2022 Series
Today’s Presenters

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Richard Woods, Georgia’s School Superintendent | Georgia Department of Education | Educating Georgia’s Future
Today’s Menu:

Appetizer
• Access to core curriculum:
  The language of science

Main Course
1. Science as ESOL
2. Science instruction
3. Science literacies

Dessert
• Resources for teachers
ESOL Language Program – LEAs’ Legal Obligations

Title VI of the Civil Rights Act of 1964 and EEOA

1. Monitor and evaluate EL students’ progress in English and academic grade-level knowledge;
2. Exit them when they are proficient in English; and
3. Monitor exited students to ensure they were not prematurely exited.

Evaluate the effectiveness of the LEA’s ESOL Program to ensure EL students acquire English and that the program is reasonably calculated to allow ELs to attain parity of participation in the standard instructional program with a reasonable time period.

Meet the needs of EL students whose parents opt them out of ESOL

Provide EL students with an educationally sound and successful ESOL Program.

Identify and screen all potential EL students in a timely, valid, and reliable manner.

Provide prepared and trained ESOL teachers and staff.

Ensure English learners have equal opportunities to participate meaningfully in curricular and extra curricular activities.

Avoid unnecessary segregation of EL students (i.e., Sheltered & Pull-out Models).

Ensure meaningful communication with EL parents.

Ensure that EL students who have or are suspected of having a disability under IDEA or Section 504 are identified, located, and evaluated in a timely manner and that their language needs are considered in evaluations and services.

ACCESS to Core Curriculum: Science
Making Language Visible using Science Courses for ESOL

Teaching the academic English associated with Georgia’s Standards of Excellence for Science, K-12
Science Courses
https://www.georgiastandards.org/Gorgia-Standards/Pages/Science.aspx

Georgia Standards of Excellence

K-5
- Kindergarten
- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5

6-8
- Grade 6
- Grade 7
- Grade 8

9-12
- Astronomy
- Biology
- Botany
- Chemistry
- Earth Systems
- Ecology
- Entomology
- Environmental Science
- Epidemiology
- Forensic Science
- Geology
- Human Anatomy & Physiology
- Meteorology
- Microbiology
- Oceanography
- Physical Science
- Physics
- Zoology

26.XX, 40.XX, and 41.XX
What ESOL delivery models could we use to develop academic English in science?

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Push-In to Science (Collaborative)</th>
<th>Scheduled ESOL with Science Focus</th>
<th>Sheltered Science (and at Newcomer Program)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.XX, 40.XX, and 41.XX</td>
<td>55.XX (Elective)</td>
<td>26.XX, 40.XX, and 41.XX</td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>Content &amp; ESOL teachers</td>
<td>Only ESOL teacher</td>
<td>Only ESOL endorsed content teacher</td>
</tr>
<tr>
<td>Students</td>
<td>Both ELs and Non-ELs</td>
<td>Only ELs</td>
<td>Only ELs</td>
</tr>
<tr>
<td>Common Reporting Errors</td>
<td>Reported as a 55.XXX course or without the additional teacher</td>
<td>Reported as a 26.XX or 40.XX course</td>
<td>Reported as a 55.XX courses</td>
</tr>
</tbody>
</table>
### Number of English Learners Scheduled in Science as ESOL, October 2020

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>ELs Scheduled in Science / ESOL</th>
<th>Total Number of ELs</th>
<th>Share of ELs in Science / ESOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>K – 5 Elementary</td>
<td>9,321</td>
<td>82,916</td>
<td>11%</td>
</tr>
<tr>
<td>6-8 Middle School</td>
<td>4,275</td>
<td>23,131</td>
<td>18%</td>
</tr>
<tr>
<td>9-12 High School</td>
<td>7,724</td>
<td>19,916</td>
<td>39%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21,320</strong></td>
<td><strong>125,963</strong></td>
<td><strong>17%</strong></td>
</tr>
</tbody>
</table>
Number of ELs Scheduled in K-5 Science by ESOL Delivery Model, October 2020

- Scheduled Language Acquisition: 15
- Resource Center / Lab: 30
- Newcomer Scheduled Language Acquisition: 77
- Sheltered Science: 85
- Dual Language Immersion: 260
- Pull-out: 626
- Push-In / Collaborative: 3683
- Innovative: 4590
- Total ELs: 9321

41.01100 – 41.01600
Middle School (6-8) Science/ESOL Courses with English Learners, October 2020

Science 6-8 as ESOL, by Delivery Models

- Scheduled Language Acquisition
- Newcomer Scheduled Language Acquisition
- Pull-out
- Newcomer Sheltered Science
- Sheltered Science
- Push-In / Collaborative
- Innovative
- Total ELs

- Physical Science (9-12) 40.01100
- Science 6-8 40.06100, 26.01100, 40.01700

6 ELs in Biology 9-12 Innovative
1 EL in Pull-out Exploratory Science

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ESOL Science Courses, Grades 9-12

Communication Skills in Science (55.02120)

- **Standards:** WIDA English Language Development Standards for Science, Grade Cluster 9-12 and Georgia Standards of Excellence for Science, Grades 9-12

- **Description:** Prepare English learners (ELs) for high school science courses by introducing them to the listening, speaking, reading, writing, and viewing skills necessary to learn foundational science crosscutting concepts, anchoring phenomenon, core ideas, and the science and engineering practices associated with the GSE for Science, 9-12. The course is individualized based on ELs’ prior learning and experiences in science.
  - **Purpose:** Teach ELs how to inform, explain and argue in English while learning to understand and communicate foundational ideas in science.
  - **Focus:** WIDA’s Key Language Uses (narrate, inform, explain, and argue) for communicating scientific ideas, Language Expectations for interpreting and expressing scientific ideas, and Language Features as resources to carry out Language Functions in the context of science.

- **Suggested ELP Levels:** WIDA Overall Composite Proficiency Level (CPL) 1-2
- **Credit:** Elective
- **Effective Date:** 3/5/2008 - **Updated:** 7/1/2021
ESOL Science Courses, Grades 9-12

Reading and Writing in Science (55.02600)

- **Standards:** WIDA English Language Development Standards for Science, Grade Cluster 9-12 and Georgia Standards of Excellence for Science, Grades 9-12

- **Description:** Supports high school science courses by teaching English learners (ELs) the reading and writing skills necessary to engage in the science and engineering practices outline in each course of the GSE for Science, 9-12
  - **Purpose:** Comprehend crosscutting scientific concepts, anchoring phenomenon, and core ideas when reading and writing / develop listening and speaking skills in context
  - **Focus:** Strategies for reading scientific texts for comprehension in order to inform, explain, and argue in writing.

- **Suggested ELP Levels:** WIDA Overall Composite Proficiency Level (CPL) 2-3
- **Credit:** Elective
- **Effective Date:** 3/5/2008 - Updated: 7/1/2021
ESOL Science Courses, Grades 9-12

Academic Language of Science and Math (55.02700)

- **Standards:** WIDA English Language Development Standards for Science and Math, Grade Cluster 9-12 and Georgia Standards of Excellence for Science and Mathematics, Grades 9-12
- **Description:** Supports high school science and mathematics courses by teaching English learners (ELs) the interpretive and expressive language skills needed to decode the specialized vocabulary, symbols, and text outlined in each course of the GSE for science and mathematics, 9-12
  - **Purpose:** Develop ELs’ academic English necessary for using the science and engineering practices as well as the mathematical standards of practice
  - **Focus:** ELs’ use of high school scientific and mathematical terminology when speaking and writing to inform, explain, and argue scientific crosscutting concepts, anchoring phenomenon, and core ideas, as well as mathematical concepts and processes.
- **Suggested EPL Levels:** WIDA’s Overall Composite Proficiency Level (CPL) 2-3
- **Credit:** Elective
- **Effective Date:** 3/5/2008 - **Updated:** 7/1/2021

ESOL State-funded Courses and Descriptions, Sept 2021
## High School (9-12) Science/ESOL Courses with English Learners, October 2020

<table>
<thead>
<tr>
<th>Science / ESOL Course</th>
<th>Total ELs</th>
<th>Innovative</th>
<th>Sheltered Science</th>
<th>Push-In / Collaborative</th>
<th>Scheduled Language Acquisition</th>
<th>Pull-out</th>
<th>Newcomer Scheduled Language Acquisition</th>
<th>Newcomer Sheltered Science</th>
<th>UNK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology I and II (26.01200, 26.01300)</td>
<td>3266</td>
<td>1955</td>
<td>830</td>
<td>449</td>
<td>27</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Science (26.06110)</td>
<td>1476</td>
<td>413</td>
<td>791</td>
<td>252</td>
<td>2</td>
<td>1</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecology (26.06100)</td>
<td>1049</td>
<td>1049</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Skills in Science (55.02120)</td>
<td>638</td>
<td>543</td>
<td>18</td>
<td>52</td>
<td>8</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Language of Science &amp; Mathematics (55.02700)</td>
<td>472</td>
<td>262</td>
<td>10</td>
<td>12</td>
<td>175</td>
<td></td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Physical Science (40.01100)</td>
<td>334</td>
<td>12</td>
<td>189</td>
<td>133</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earth Systems (40.06400)</td>
<td>288</td>
<td>24</td>
<td>61</td>
<td>198</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
More High School Science/ESOL Courses with English Learners, October 2020

<table>
<thead>
<tr>
<th>Science / ESOL Course</th>
<th>Sheltered Science</th>
<th>Innovative</th>
<th>Push-In / Collaborative</th>
<th>Total ELs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zoology / AP Zoology</strong> (26.071000)</td>
<td>52</td>
<td>28</td>
<td>6</td>
<td>86</td>
</tr>
<tr>
<td><strong>Forensic Science</strong> (40.093000)</td>
<td>72</td>
<td>3</td>
<td>9</td>
<td>84</td>
</tr>
<tr>
<td><strong>Human Anatomy / Physiology</strong> (26.073000)</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td><strong>General Horticulture &amp; Plant Science</strong></td>
<td>3</td>
<td>4</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td><strong>Basic Agricultural Science</strong> (02.471000)</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Naval Science III</strong> (28.02500)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Oceanography</strong> (40.071000)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Teaching English learners the English needed to engage in science and engineering practices
Science is a Story Told in 3 Dimensions

- The story starts with a topic that students need to find out more information about.
- It ends with students explaining, arguing, or modeling their ideas.
- Based on A Framework for K-12 Science Education.

THREE DIMENSIONS OF THE FRAMEWORK

- CORE IDEAS
- CROSSCUTTING
- PRACTICES

What scientists know
What scientists think & link
Phenomena
The Vision of 3D Science

Students actively engage in SEPs and apply CCCs to deepen understanding in the DCIs.

<table>
<thead>
<tr>
<th>Science and Engineering Practices</th>
<th>Crosscutting Concepts</th>
<th>Core Disciplinary Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Asking questions and defining problems</td>
<td>• Patterns</td>
<td>• Matter and its interactions</td>
</tr>
<tr>
<td>• Developing and using models</td>
<td>• Cause and effect</td>
<td>• Motion and stability: Forces and interactions</td>
</tr>
<tr>
<td>• Planning and carrying out investigations</td>
<td>• Scale, proportion, and quantity</td>
<td>• Energy</td>
</tr>
<tr>
<td>• Analyzing and interpreting data</td>
<td>• Systems and system models</td>
<td>• Waves and their applications in technologies for information transfer</td>
</tr>
<tr>
<td>• Using mathematics, information and computer technology, and computational thinking</td>
<td>• Energy models</td>
<td>• Structure and processes in living organisms</td>
</tr>
<tr>
<td>• Constructing explanations and designing solutions</td>
<td>• Energy and matter</td>
<td>• Ecosystems: Interactions, energy, and dynamics</td>
</tr>
<tr>
<td>• Engaging in argument from evidence</td>
<td>• Structure and function</td>
<td>• Heredity: Inheritance and variation of traits</td>
</tr>
<tr>
<td>• Obtaining, evaluating, and communicating information</td>
<td>• Stability and change</td>
<td>• Biological evolution: Unity and diversity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Earth’s place in the universe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Earth’s systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Earth and humanity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Engineering design</td>
</tr>
</tbody>
</table>
Science & Engineering Practices - What Scientists and STUDENTS Do
Stem Teaching Tool Brief #27 – Engaging ELs in the Science & Engineering Practices – Things to Consider

• “Practice-linked instruction is a powerful motivator for engaging students.
  • Students should be encouraged to investigate phenomena of interest whenever possible.
  • After a large-group inquiry, the process can be reconstructed in written or verbal language—in developmentally appropriate ways and using scientific language.”

Authors: KERRI WINGERT AND TIM PODKUL, 2014-2021
### What Scientists & Students Do

- Each standard in K-12 science begins with the science practice of obtain, evaluate, and communicate information.
- Each standard element contains a science practice.

<table>
<thead>
<tr>
<th>Obtain</th>
<th>Evaluate</th>
<th>Communicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Obtain Information</td>
<td>• Evaluate Information</td>
<td>• Communicate Information</td>
</tr>
<tr>
<td>• Ask Questions/Define Problems</td>
<td>• Analyze Data</td>
<td>• Using Argue from Evidence (written/oral)</td>
</tr>
<tr>
<td>• Plan &amp; Carry Out Investigations</td>
<td>• Use Mathematics and Computational Thinking</td>
<td>• Use Models to Communicate</td>
</tr>
<tr>
<td>• Use Models to Gather Data</td>
<td>• Construct Explanations/Solve Problems</td>
<td></td>
</tr>
<tr>
<td>• Use Mathematics and Computational Thinking</td>
<td>• Developing Arguments from Evidence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Use Models to Predict &amp; Develop Evidence</td>
<td></td>
</tr>
</tbody>
</table>

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3D Science in a Sample Standard

**SKP1.** Obtain, evaluate and communicate information to describe objects in terms of the materials they are made of and their physical attributes.

c. Plan and carry out investigations to predict and observe whether objects, based on their physical attributes, will sink or float.

*The HOW (science and engineering practice)*

Crosscutting concepts: Structure & Function/ Cause & Effect

The **WHY (why students want to engage)** - Start with a phenomenon: Some objects float, and others sink!
Designing Phenomenon-Based Instruction

1. Think About the Performance Expectation
   Disciplinary Core Ideas – physical attributes

2. What phenomenon requires the core idea to explain?
   Phenomenon – boats that float

3. How will students interact with the phenomenon?
   Science & Engineering Practices – plan and conduct investigations

4. What “lens” will the students use to study the phenomenon?
   Crosscutting Concepts – structure/function and cause/effect
“When students understand that phenomena have causes, they are better prepared to seek evidence to support explanations; helping students see causes for phenomena about which they are curious is a powerful way to motivate learning.” - Brett Moulding
Stem Teaching Tool Brief #66 – Things to Consider when Developing Conceptual Meaning

• “All learners come to classrooms with resources for communicating that are productive for learning and participating.
  • Most learners can draw upon multiple ways of communicating (e.g., different languages, registers, gestures) as they navigate different learning situations”

• “Multilingual students’ learning and participation increase when they have access to a broader repertoire of ways to make sense of and talk about the natural phenomena they investigate and observe.”

Authors: ENRIQUE SUÁREZ, PHILIP BELL, AMBER MCCULLOCH & MARY STARR, 2014-2021
Stem Teaching Tool Brief #66 – Things to Consider when Developing Conceptual Meaning

• “Multilingual students are not just developing scientific fluency.
  • They are also able to develop their fluency in the multiple languages they speak when they leverage them for meaningful activities, like learning science.
  • This can help them identify with science and broaden participation.”

Authors: ENRIQUE SUÁREZ, PHILIP BELL, AMBER MCCULLOCH & MARY STARR, 2014-2021
STEM Teaching Tool: Brief #6 – Things to Consider when Learning Science by Productively Talking

• "The science and engineering practices in the National Research Council (NRC) Framework are deeply social and require that students communicate. They involve reasoning with others and seeking a shared understanding of science phenomena.

• The goals of productive talk include:
  (1) sharing and clarifying one’s own thinking,
  (2) listening to one another,
  (3) deepening one’s own reasoning, and
  (4) thinking together."

How to make language visible in 3D Science?

• Immerse EL students in an experience
• Ensure EL students engage in complete 3D Science cycle: obtain, evaluate and communicate
• Teach EL students how to explain, in English, their observations of objects, what made them move, what would make them move more efficiently, etc.
Shifting Science Teaching

Address questions – engage students!

From teaching about science

From teaching a set of core science ideas as the outcome

TO

engaging students in science and engineering practices

TO

engaging students in using science core ideas to support explanations for phenomena
The Power of a Story – The Power of a Phenomenon

- After obtaining information, students are now primed to communicate by speaking and writing.
- Leading with phenomenon and trying to figure it out, by listening and reading, creates that story or mystery.
- Science crosscutting concepts prompts a lot of discourse and students’ desire for action.
- These can be channeled into the disciplinary literacies of science.
Making Language Visible
Teaching WIDA’s ELDS for Science
Collaborating with content teachers to teach science and language in tandem
Rolling out the WIDA ELD Standards Framework, 2020 Edition

Year 1
- 2020-2021
- Becoming familiar with the ELD Standards Framework, 2020 Edition

Year 2
- 2021-2022
- Initial implementation of standards framework
- LEA’s Roll-out plan

Year 3
- 2022-2023
- Expanding implementation and refining practice
Collaboration and Teaching Resources (handouts)

What Can Collaboration Look Like with the WIDA ELD Standards Framework?

Design Principles for Engaging Multilingual Learners in Three-Dimensional Science

WCER Working Paper No. 2020-1
February 2020

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Troy Dausler
WIDA, Wisconsin Center for Education Research, University of Wisconsin-Madison

Tricia Shelton
National Science Teaching Association

Jennifer Wilfrid
WIDA, Wisconsin Center for Education Research, University of Wisconsin-Madison
**GSE for Science**

**SKP1.** Obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes.

a. Ask questions to compare and sort objects made of different materials.

b. Use senses and tools to classify common objects according to their physical attributes (color, size, shape, weight, and texture).

c. Plan and carry out an investigation to predict and observe whether objects, based on physical attributes, will sink or float.

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**WIDA Language Expectations, Functions, and Features**

**ELD-SC.K.Inform.Expressive**

Construct scientific informational texts that…

- Introduce others (through oral recounting) to a topic or entity through pictures, words, drawings, using generalized nouns to identify class of things, and demonstrative pronouns (it, they) to reference entity

- Provide details about an entity using verbs to label actions, adjectives to identify physical attributes, prepositional phrases to tell where, and words to categorize, compare, or contrast information.
GSE for Science

S5L4. Obtain, evaluate, and communicate information about how microorganisms benefit or harm larger organisms.

a. Construct an argument using scientific evidence to support a claim that some microorganisms are beneficial.

b. Construct an argument using scientific evidence to support a claim that some microorganisms are harmful.

WIDA Language Expectations

ELD-SC.4-5.Argue.Expressive

Construct scientific arguments that…

- Introduce topic/phenomenon in issues related to the natural and designed world
- Make and define a claim based on evidence, data, and/or model
- Establish a neutral tone or an objective stance
- Signal logical relationships among reasoning, relevant evidence, data, and/or a model when making a claim
Sample: Science. Grade 5. Argue (pp. 124-125)

### Language Functions & Features

**Introduce topic/phenomenon related to the microorganisms through...**
- Generalized nouns to define benefits/harm
- Relating verbs to define benefits/harm
- Expanded noun phrases to add clarity, classify, or add descriptions

**Make and define claim based on evidence, data, and/or model through...**
- Expanded noun groups to add precision and details
- Connectors to link ideas
- Maps, diagrams, graphics, data to support claim/evidence
GSE for Science

SEV5. Obtain, evaluate, and communicate information about the effects of human population growth on global ecosystems.

a. Construct explanations about the relationship between the quality of life and human impact on the environment in terms of population growth, education, and gross national product.

WIDA Language Expectations

ELD-SC.9-12.Explain.Expressive

Construct scientific explanations that...

- Describe reliable and valid evidence from multiple sources about a phenomenon
- Establish neutral or objective stance in how results are communicated
- Develop reasoning to illustrate and/or predict the relationships between variables in a system or between components of a system
- Summarize and refine solutions referencing scientific knowledge, evidence, criteria, and/or trade-offs
## Language Functions & Features

Describe reliable and valid evidence from multiple sources about a phenomenon through…

- Abstract nouns to introduce concepts, ideas, and technical terms
- Cohesion to reference ideas, information across texts (pronouns, substitutions, renaming, synonyms, collocations)
- Relating verb groups to state relationships or attributes
- A variety of structures (embedded clauses, relating verbs, nominalizations, and noun groups) to define a phenomenon
Resources for Teachers
Today’s Dessert!
Professional Learning Opportunities

Professional Learning

- Need Professional Learning Community resources? See the PLC Science in 3D for 10 guided discussions that can be used throughout the year to learn more about the structure, background and intended outcomes of the GSE.

- To join a science email list to receive updates and newsletters from the science program, please send a blank email to one or more of the following email addresses below:

  Science K-5:
  join-science-k-5@list.doe.k12.ga.us

  Science 6-8:
  join-science-6-8@list.doe.k12.ga.us

  Science 9-12:
  join-science-9-12@list.doe.k12.ga.us

Science Videos:

Reading, Writing, and Science: The Perfect Combination

What does literacy have to do with science? Everything! As students obtain, evaluate, and communicate information throughout courses and grades, literacy is an integral piece. Celebrate literacy with the GaDOE science team and author Jodi Wheeler-Toppen in the following video series. Find tips and strategies to support your science classroom being a space where students read, write, speak, and think. Consider using these resources and table tents that are shown in the videos.

Elementary:

- Integrating Writing and Science: An Introduction for Elementary School Teachers and Administrators
- Integrating Reading and Science: An Introduction for Elementary Teachers and Administrators
- Writing about Claims, Evidence, and Reasoning: For Elementary Educators
- Sentence Frames for Reading, Writing, and Forming Science Knowledge: For Elementary School and ESOL Teachers
Middle/High:

- Integrating Writing and Science: An Introduction for Middle and High School Teachers and Administrators
- Integrating Reading and Science: An Introduction for Middle and High School Teachers and Administrators
- Signal Words for Reading, Writing, and Forming Science Knowledge: For Middle and High School Teachers
- Writing about Claims, Evidence, and Reasoning: For Middle and High School Educators

K-12:

- Reading Strategies Part 1: Make it Make Sense: For Teachers in Grades K-12
- Reading Strategies Part 2: Problem-Solving Tools
- Knowing Enough to Read: How Background Influences Science Comprehension
- Before and After Writing: Prewriting and Evaluation
- Integrating Reading, Writing, and Science in the K-8 Classroom: A Call to Action for Administrators
Next Steps for Making Language Visible in Science

• Ensure teachers watch these videos to learn more about 3D Science for English learners
  • Synergy of Science and the English Language
  • Mining for Science Resources
  • Science Professional Learning Playlist

• Encourage teachers to take the SLDS/PL course on 3D Science