

Project Name: Authentic Literacy and Language (ALL) for Science	
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Website: https://allforscience.org	If SEPA project, URL for project on https://nihsepa.org/ https://nihsepa.org/project/authentic-literacy-and-language-all-for-science/

Brief Program Description (50 – 60 words) This framework engages students in small group scientific inquiry based on a model organism or system and related text-based inquiry using existing informational resources. This approach emulates how scientists connect their investigations to literature and use multiple information sources to advance understanding. Its design enables language and skills development leading to participation in an incipient teacher-guided community of practice.

Program and Participant Characteristics		Program Activities
Program type (Please check all that apply): <input checked="" type="checkbox"/> Curriculum. <input type="checkbox"/> Out-of-school program <input type="checkbox"/> Exhibit <input type="checkbox"/> Interactive multimedia <input type="checkbox"/> Teacher PD <input type="checkbox"/> Research experiences for students or teachers <input type="checkbox"/> Other (describe):	<div style="border: 1px solid #00a651; border-radius: 15px; padding: 10px; background-color: #e0f2f1; margin-bottom: 10px;"> <p style="text-align: center; color: #00a651;">Guided Science Investigation</p> <p style="text-align: center;">Firsthand science inquiry activities, in which teachers facilitate students' collaborative work related to a model organism or system to build understanding of core ideas and crosscutting concepts in science.</p> </div> <div style="font-size: 2em; color: #757575; margin: 0 auto;">↓</div> <div style="border: 1px solid #00a651; border-radius: 15px; padding: 10px; background-color: #e0f2f1; margin-bottom: 10px;"> <p style="text-align: center; color: #00a651;">Mini-lessons on Science-specific Disciplinary Literacies</p> <p style="text-align: center;">Whole group mini-lessons that focuses on a reading strategy relevant for use with science expository texts or media.</p> </div> <div style="font-size: 2em; color: #757575; margin: 0 auto;">↓</div> <div style="border: 1px solid #00a651; border-radius: 15px; padding: 10px; background-color: #e0f2f1;"> <p style="text-align: center; color: #00a651;">Science Inquiry Circles</p> <p style="text-align: center;">Small groups, similar to reading circles, in which learners apply and practice discipline specific reading strategies to their own text-based research.</p> </div>	<p>After 2023 pilots two Grade 4 ALL for Science units were revised and implemented in classrooms across the state of Texas:</p> <p>Plant Adaptations: Past and Present</p> <ul style="list-style-type: none"> In this unit, children investigate fossil images and live plants to learn about the different groups of plants that have existed (and still exist) on Earth. The unit is designed to develop understanding about the relationship between plants and the environments where they live. <p>Exploring Inherited and Acquired Traits</p> <ul style="list-style-type: none"> In this unit, children investigate live plants to learn that inherited and acquired traits are two types of characteristics present in an organism. The unit is designed to develop learners' ability to differentiate between inherited traits, which are down from parents, and acquired traits, which are not.
Setting(s): <input checked="" type="checkbox"/> Formal <input type="checkbox"/> Informal		
Types of participants <input checked="" type="checkbox"/> Students <input checked="" type="checkbox"/> Teachers <input type="checkbox"/> Scientists <input type="checkbox"/> Families <input type="checkbox"/> Public <input type="checkbox"/> Other (describe):		
Grade level(s) of participants <input type="checkbox"/> PreK <input checked="" type="checkbox"/> Elementary (K-5) <input type="checkbox"/> Middle (6-8) <input type="checkbox"/> High (9-12) <input type="checkbox"/> Adult		
Characteristics of the populations you serve relative to DEIA: Majority underrepresented in STEMM		

Evaluation	Key Accomplishments and/or Findings
<p>Constructs measured</p> <p><input checked="" type="checkbox"/> Content knowledge <input checked="" type="checkbox"/> Skills</p> <p><input type="checkbox"/> Nature of science <input type="checkbox"/> Career awareness</p> <p><input type="checkbox"/> Attitudes (e.g., interest, identity, belonging)</p> <p><input checked="" type="checkbox"/> Quality or fidelity of implementation</p> <p><input type="checkbox"/> Other (describe):</p>	<ul style="list-style-type: none"> • Overall Findings: Participation in an ALL for Science unit <i>effectively “closed the gap” across all learner groups</i> with regards to science knowledge as measured in pre/post assessments. Outcomes from the Plants curriculum pilot in 2023 also had positive learning gains, on average for the 80 participating children, and feedback from teachers has been used to revise the modules for the 2024 implementation. • Fall and Winter 2024 – <ul style="list-style-type: none"> ○ Revisions were made to the Plant Adaptations and Exploring Inherited and Acquired Traits units based on feedback from the 2023 pilots. • Spring 2024 – <ul style="list-style-type: none"> ○ Both units were implemented across the state of Texas; currently 44 teachers are implementing in Grade 4 classrooms ○ Meeting with advisory committee to update members on project progress, discuss needs for future units in Grade 5 and broadly and brainstorm approaches to implementation challenges • Presentations June 2023-May 2024 – <ul style="list-style-type: none"> ○ National Science Teachers Association Meeting ○ Texas Region IV Science Conference ○ Conference for the Advancement of Science Teaching ○ Southwest Educational Research Association • Publications submitted and under review – <ul style="list-style-type: none"> ○ An Integrative Review of Research on Science-Specific Disciplinary Literacy: Trends, Learner Outcomes, and Teacher Practices. ○ Authentic Literacy and Language (ALL) for Science: Evaluating an Instructional Framework to Develop Science-based Disciplinary Literacy with Young Children.
<p>Methods</p> <p><input checked="" type="checkbox"/> Tests/surveys <input checked="" type="checkbox"/> Interviews/focus groups</p> <p><input type="checkbox"/> Observations <input checked="" type="checkbox"/> Artifacts (e.g., student work)</p> <p><input type="checkbox"/> Other (describe):</p>	
<p>Design characteristics</p> <p><input type="checkbox"/> Comparison or control group</p> <p><input checked="" type="checkbox"/> Pre/post surveys or assessments</p> <p><input type="checkbox"/> Longitudinal tracking of participants</p> <p><input type="checkbox"/> Other (describe):</p>	
Project Lessons Learned	
<ul style="list-style-type: none"> • Recruitment needs change over time; ensure alignment with teacher expectations and state/school needs when planning over time. • As classroom and instructional formats change, flexibility and adaptability of the framework may be needed. 	
Questions, Advice Wanted, or Topics of Discussion for the SciEd Community (optional)	
<p>Innovative recruitment approaches</p> <p>Existing measures of science-specific disciplinary literacy</p>	