This article describes an approach for generating background knowledge and sustaining inquiry and introduces the Learning Workshop.

Gabrielle  Look at this giant alligator!
Luke       My book has a diving beetle eating a tadpole!
Zoe        Look, this plant eats flies! They fall down in here and land in this pool and never come out.
Matt       I found lots of words about wetlands for the matrix. I have water spider, food chain, freshwater, and adapt on my sticky notes.
Jodi       These birds have long legs and long bills so they can wade in the water and catch fish to eat.

Eagerly sharing discoveries with classmates in the Learning Workshop, these second-grade students (pseudonyms used) displayed joyful learning as they were deeply immersed in exploring a nonfiction text set of books about the wetlands habitat. As they read, students determined important words and wrote them on sticky notes.

When the class came back together, students talked about their domain-specific words, such as amphibian, and arranged them on an interactive class organizer called a Generative Vocabulary Matrix (GVM; Figure 1). On a separate companion language chart, the teacher recorded academic language showing relationships among core concepts, such as if/then and so that, and specialized word choice, such as predator and devour (Figure 2). As novice scientists, students were using the vocabulary and practices of experts as they conducted investigations and organized information for a class book about the importance of wetlands.

Because words are labels for concepts, vocabulary learning should be embedded within a larger schema in a content area domain as a necessary condition for comprehending content and text (Nagy & Herman, 1987). Consistent with generative learning theory (Wittrock, 1974), the GVM supports generative processes of learning to actively make sense of content.

Generative processes include building rich relations among concepts, linking prior knowledge to new information, actively constructing meaning, and transferring experience and knowledge to new

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The Learning Workshop is a four-step inquiry approach, and the GVM is a tool for promoting increasingly sophisticated generative processes within each step (Table). The nature of meaning-making discourse with the teacher shifts as students organize concepts and gain increasing control over new language and vocabulary. Students’ schema is gradually transformed, leading to higher levels of intellectual development and productive thinking for addressing new situations (Vygotsky, 1962).

This article explains (a) how teacher teams designed and implemented a disciplinary science unit according to the four-step Learning Workshop sequence and (b) how the GVM was used in each step of the Learning Workshop to support meaning-making engagement with vocabulary and academic language.

**Time for a Learning Workshop**

We know that children benefit from classroom conditions that allow time for immersion in interesting texts, active engagement with words and language, and use of readings in meaningful and authentic ways (Cambourne, 2000). However, how can teachers find more time, given daily scheduling constraints? How can teachers meet standards, complete curriculum requirements, and provide vocabulary instruction without sacrificing students’ natural curiosity, wonder, and enjoyment of informational texts?

To address these concerns, elementary teachers seamlessly blended all instructional time from reading workshop, writing workshop, and content area learning into one unified Learning Workshop. Extended time afforded quality literacy and learning engagement.

**A Context for Sustained Vocabulary Engagement**

By itself, extended classroom time does not guarantee motivation or meaningful engagement with vocabulary. Research suggests that sustained engagement in literacy activity is the avenue to learning (Guthrie & Wigfield, 2000). Seeking to motivate and sustain rich vocabulary experiences in the classroom, our teacher teams incorporated relevant research on vocabulary interaction, disciplinary literacy, and sustained engagement.
The Importance of Vocabulary Interaction

Actively organizing information into a conceptual framework helps students learn related information quickly and facilitates application of knowledge to new situations (Bransford, Brown, & Cocking, 2000). Student self-collection of words is associated with choosing important and challenging vocabulary, retention of learning, and motivation (Ruddell & Shearer, 2002).

After students and the teacher contribute and arrange words meaningfully on the GVM, conceptual categories of words are labeled (Taba, 1967) and a semantic framework emerges. As with any concept organizer, the GVM may be organized as a web, table, flow chart, array, cycle, Venn, sequence, problem/solution, or other text structure, depending upon the curricular goal. While one meaning of the word matrix refers to a specific graphic organizer that resembles...
“In the Learning Workshop, vocabulary is spotlighted at the point of relevance during learning experiences, integrated into the GVM, and meaningfully used to generate knowledge.”

a table format, the definition of matrix for the GVM technique reflects a deeper sense of the word. Originating from the Latin mater, or mother, a matrix is a place where something originates and develops (“Matrix,” n.d.).

Likewise, the GVM provides a place where meaning is generated from the starting point of students’ experiences and prior knowledge. With teacher guidance, understanding increasingly develops as students actively integrate and organize new information into what becomes a clear and coherent framework.

Because the GVM technique scaffolds the process of generating conceptual knowledge, the resulting format will depend upon the nature of the content. For example, the life cycle of a butterfly might be represented as a cycle diagram. Attributes of an animal might be displayed as an array.

The development of the GVM was informed by features of Vocabulary Visits (Blachowicz & Obrochta, 2005) and Text Talk (Beck & McKeown, 2001), which target vocabulary development in interactive language contexts. The GVM and the Learning Workshop build on this research by (a) adding a central conceptual structure that serves as a dynamic placeholder for schema and language development and (b) creating a motivating workshop environment.

Just as identifying text structure aids comprehension while reading (Armbruster, Anderson, & Ostertag, 1987), the GVM helps students build a meaningful conceptual schema while learning. Students benefit when they retrieve relevant information at just the right time and add it to their schema to construct meaning (Kinsch, 2004).

In the Learning Workshop, vocabulary is intentionally spotlighted at the point of relevance during learning experiences and integrated into the GVM. Meaningful use of both academic language and domain-specific vocabulary is associated with conceptual understanding, reasoned thought, and development (Gee, 2004; Larson, 2011). Known as Tier 2 and Tier 3 words (Beck, McKeown, & Omanson, 1987), both academic language and core vocabulary were used by our students to make meaning with others.

The Importance of a Disciplinary Literacy Approach

The Learning Workshop emphasizes a disciplinary literacy approach in which learning and literacy activity resemble the language and practices that experts actually use in their field. These include asking questions; collaborating with others; carrying out investigations; valuing and interpreting evidence; constructing explanations and arguments; building background knowledge from content-rich texts; and obtaining, evaluating, and communicating information (Achieve/Next Generation Science Standards, 2013a; National Council for the Social Studies, 2010; National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010).

Experts in every field draw from a richly structured knowledge base that helps them select and remember information (Bransford, Brown, & Cocking, 2000), making the GVM an authentic tool in a disciplinary literacy approach. Immersion in meaningful, situated use of vocabulary and language is essential for acquiring the norms of discourse for a particular subject area (Gee, 2001).

When reading tasks and topics are relevant to students’ lives, motivation is enhanced (Gambrell, 2011). A disciplinary literacy approach may contribute to sustained engagement because of the emphasis on authentic, relevance-generating learning activity.

The Importance of Sustained Engagement

Motivation is defined as “the process whereby goal-directed activity is instigated and sustained” (Pintrich & Schunk, 2002, p. 5). To keep students interested and engaged in learning, our teachers infused research-based elements of backwards design (Wiggins & McTighe, 2005), flow (Shernoff & Csikszentmihalyi, 2009), and interest development (Hidi & Renninger, 2006) into their content area plans.

Interest is a motivational aspect of learning, and it develops in four cumulative phases from triggered situational interest to individual interest. This research led to the development of the EngageALL planning model, a sequence of instruction designed to sustain engagement by helping teachers organize instructional activity according to the way interest naturally develops: Engagement in Academic Literacy for Learning (Larson, 2011). EngageALL has also been used successfully with older students (Larson, 2014).
The Generative Vocabulary Matrix in a Second-Grade Learning Workshop

Planning
To target the disciplinary core ideas of biodiversity and relationships in ecosystems, second-grade teachers collaborated to design a life science unit on the wetlands biome. Teachers created the big idea questions first, which guided their decision to use a table format (Figure 3) to structure the GVM:

Big idea of the curriculum
Biodiversity: “There are many different kinds of living things in any area, and they exist in different places on land and in water.” (Achieve/NGSS, 2013b)

Big idea questions for students
What are the layers of the wetlands?
What plants and animals live there?
What is special about wetlands life?

Teachers created the scenario-based performance assessment using the RAFTs technique (Groenke & Puckett, 2006):

Role
You are an environmental scientist.

Audience
You are writing to children and families and to the principal and a neighboring class.

Format
You will contribute a chapter to a field guide.

Topic + strong verb
Explain a feature of the wetlands environment.

Vocabulary selection was adapted from the three tiers of words framework (Beck, McKeown, & Omanson, 1987) and proximal to students’ current knowledge (Figure 4). Instructional activities were sequenced according to the characteristics of the four-step EngageALL model. Teachers prepared a text set, a learning wall, and materials.

Step 1: Situate the Inquiry—Make It Real and Relevant

Characteristics of Step 1 of the Learning Workshop. To trigger situational interest, the teacher draws students into a surprising or inquiry-provoking activity to spark active, meaningful engagement in a real-world topic. A problem-based scenario connects the inquiry to the big idea of the curriculum and puts a focus on an authentic performance goal. Students are exposed to new vocabulary and academic language and also use everyday language to make initial meaning with others.

How Teachers Implemented Instruction in Step 1. To captivate curiosity, each teacher put on swimming
fins and attempted to walk across the room. Laughter and questions filled the air as students speculated about the upcoming learning activity. Teachers asked students: “If I were an animal, why would I need feet like this? What animal might I be? Where would I live? What would I need? What would I worry about?”

Teachers engaged students in observing and discussing large photographs of a mallard duck, a turtle, and a frog. Students gathered around a table to examine several live animals—a frog, a garter snake, a turtle, and a fish—noting movements and physical features, sharing known information and experiences, and predicting where these animals might live. Teachers asked students what they wondered as they looked at the animals and then explained that observing for patterns and asking questions are important in the work of real scientists.

Teachers projected a cut-away illustration of a wetlands habitat to point out the different zones, or layers where wetlands plants and animals live: below the surface of the water, at the surface of the water, and beside the water. As students shared their thinking, teachers wrote key understandings on sticky notes and posted them on the learning wall: frog, duck, fish, and crayfish.

The big idea questions were presented to students in kid-friendly language: What are the layers of the wetlands? What plants and animals live there? What is special about wetlands life?

To further hook students into the real-world topic, students were asked to engage in the work and words of scientists through active inquiry. Each student was provided with a brand-new inquiry notebook in which to collect observations, note patterns, and record thinking throughout the unit.

The first task was to record observations and curiosity questions using a three-column format: What I notice, Why I think it lives ___ (below, at the surface, beside the water), What I wonder. Teachers asked students to work together as scientists and closely observe their choice of several plants and animals that were on display in stations around the classroom.

Students rotated in trios among the stations, in which either live specimens or large colorful photographs were displayed and labeled: turtle, salamander, snake, frog, dragonfly, cattail, fern, duck, hawk, diving beetle, red-winged blackbird, fish, snail, willow, freshwater shrimp, leech, beaver, duckweed, pondweed, crayfish, mosquito. As students talked about their observations and recorded their thinking, teachers circulated to guide the investigations.

Students returned to their seats for a whole-class sharing of ideas. Each student wrote a favorite curiosity question on a sticky note and posted it near the big idea question on the learning wall (see Figure 1).

Teachers wrote the names of plants and animals on individual sticky notes and passed them out to partners. Together, partners determined and justified the placement of their plant or animal in the generative vocabulary matrix. They also began to explore the connections between the new domain-specific content vocabulary and their everyday experiences with these wetlands plants and animals.

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**Figure 4 Vocabulary Selection for a Second Grade Wetlands Unit**

<table>
<thead>
<tr>
<th>Second-Grade Wetlands Unit Vocabulary Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Domain-Specific Content Vocabulary</td>
</tr>
<tr>
<td>adapt, zone, wetlands, plankton (and other new animal and plant names), food chain, floodwater, marsh, bog, swamp, fen</td>
</tr>
<tr>
<td>Known Supporting Core Vocabulary</td>
</tr>
<tr>
<td>habitat, tadpole (and others), ecosystem, extinct, mammals, reptiles, hibernate</td>
</tr>
<tr>
<td>Academic Language That Shows Relationships</td>
</tr>
<tr>
<td>if/then, because, so, that’s why, so that, a type of, such as, for example, ___ is eaten by ___</td>
</tr>
<tr>
<td>Specialized Word Choice</td>
</tr>
<tr>
<td>predator, species, provide, destroy, oxygen, migrate, consume, devour, survive, contaminated, surface</td>
</tr>
<tr>
<td>Everyday Science Words</td>
</tr>
<tr>
<td>pollution, float, beside, wildlife, roots, melt</td>
</tr>
<tr>
<td>Everyday Words</td>
</tr>
<tr>
<td>layers, notice, protected, spongy, live, catch, eat, breathe</td>
</tr>
</tbody>
</table>
animal in a wetlands layer (Figure 5). Students were encouraged to use words and language to orally communicate their thinking process:

Jamal  *Crayfish goes below the surface* because it lives underwater.

Zach  *Alligator goes on the surface*, because that’s where he swims... but he can also go *below the surface* and on the *shore* if he wants to!

Yesenia  *Duckweed lives on the surface* because the leaves float on the water and the roots hang down.

Teachers spotlighted Tier 2 words that students used and posted them on the language chart with the label *Words that scientists use.* Words included academic language, or “Language for thinking,” such as because, a type of, when, according to, and if/then, and “Word choice for science,” such as survive, hibernate, feed on, observed, and species.

Each teacher engaged students in an interactive read-aloud of *Life in the Wetlands* by Carolyn Scrace to expose them to new vocabulary, content, and academic language. New words were periodically spotlighted at the point of relevance in the context of reading, discussed with students, and written on sticky notes.

During the read-aloud, teachers would occasionally ask students to turn to a partner and use the words and language to either explain an idea or talk about why the words go together. For example, the teacher pulled several sticky notes together to elicit an explanation:

Teacher  Use these words to tell how a wetland can be made: *if, snow, rivers, overflow, wetland.*

Partners If a lot of snow melts, or if rivers overflow, then the extra water can make a wetland.

Sometimes the teacher wrote these sentences on the board for students to read chorally.

The teacher provided book talks on several interesting nonfiction texts that represented a variety of formats. A field guide structure was selected for its authenticity as a manual that scientists might create. The book, *Wetlands* by Rose Pipes, would be used as the mentor text for the class big book project.

The performance goal and real-world scenario were communicated to students. Teachers explained that real scientists often come together and contribute their special expertise to create one book about a big topic. Each student scientist would be a contributing author and provide details about an interesting relationship in the wetlands biome.

Rather than choose general subjects such as hawks or frogs, students were encouraged to investigate a topic that showed some kind of relationship in the wetlands, such as a particular food chain, or a specialized feature that helps a plant or animal survive in the wetlands. Information from the GVM and students’ personal semantic maps would be used to organize the writing and promote the use of core vocabulary and language.

**Step 2: Investigate and Construct Knowledge—Keep It Engaging**

**Characteristics of Step 2 of the Learning Workshop.** To maintain situational interest initiated in the first step, the teacher keeps students actively involved in the learning activity. Group activity is enjoyable, meaningful, and intended to sustain attention and persistence. Personal meaning and interests are nurtured through opportunities for exploration. Students experiment with academic language and vocabulary to enhance understanding.
How Teachers Implemented Instruction in Step 2. To address the learning goal and to maintain situational interest generated in the first step, teachers engaged students in an exploratory investigation of a text set. Students eagerly scrambled toward the beautifully displayed set of nonfiction texts with blank sticky notes and markers in hand.

Students were encouraged to choose and enjoy the books first and then select and write key words on sticky notes (Figure 6). Natural curiosity and wonder prevailed as spontaneous comments filled the air:

**Daniel**       **Whoa, the alligator can get the duck!**

**Madison**      **I like the water lilies.**

**David**        **I wonder if all the animals in the wetlands hibernate.**

**Priya**        **Look at this! When the beaver is swimming under the water, he can see through his eyelids like goggles!**

**Luis**         **I wonder what it would be like to be a crayfish.**

**Ravi**         **I found out that herons eat fish and mice and bugs—ew!**

**Kelsey**       **Diving beetles bring a bubble of air with them under the water to breathe!**

Each teacher circulated among students to confer, guide reading, and share in the wonders of nature. Focused attention and persistence were observed as partners shared their discoveries with each other and as personal interests began to emerge.

When whole-class discussion resumed, students explained to the class how their sticky notes could be organized into the GVM. Then teachers carefully focused their instruction on language and content:

**Teacher**       **We are reading about food chains in the wetlands habitat. Come up with a partner and think about words from our vocabulary matrix that might make sense together about a food chain.**

*(Brandon and Cody come up and confer with each other.)*

**Brandon**       **Tadpoles and plankton go together.**

**Cody**          **And raccoons and carp.**

**Teacher**       **Why?**

**Cody**          **Because tadpoles feed on plankton.**

**Teacher**       **Wow, I like that you used the words *feed on*. Let’s write that on our language chart. That’s the kind of language that scientists use. Now tell your whole food chain idea to the class.**

**Brandon**       **Tadpoles feed on plankton in the wetland food chain; then bigger animals eat the tadpoles, like raccoons and carp.**

**Teacher**       **Great! Let’s write that science sentence here and then read it together with the class. (Choral reading.) You know, I’m thinking of a word that we added to our language chart that we could use here instead of *animals*. Brandon and Cody, you can call on someone from the class if you like.**

**Alexis**         **Predator.**

**Teacher**       **Let’s see how it sounds. Bigger *predators* eat the tadpoles. Why might we choose *predator* instead? … Another word we might add to our language chart is *prey on*. … What are some other words for *eat*? (devour, consume) When you read in your books about food chains, you will sometimes see it written this way: *Tadpoles are eaten by fish*. That might be confusing, so let’s draw a picture of that…**

Turn to a partner and choose some words from our vocabulary matrix and language chart and talk about another wetlands food chain. You may check your facts in our text set. Remember to say it like a scientist! Then write it in your inquiry notebook. After that, turn and read it to a new partner. Then we will add some food chains to our language chart.
“Students quickly embraced and grappled with increasingly complex texts after gaining confidence through vocabulary and academic language interaction; students ‘worked up to reading’ complex texts.”

This dialogue illustrates how the GVM and language chart can be used to support verbal expression and knowledge generation. Intensive engagement in “cognitively challenging talk” helps students deepen understanding and memory of concepts (Gee, 2001, p. 724).

To cultivate personal interest, students were asked to choose a favorite feature associated with the wetlands environment and meet with others to talk about shared interests. Teachers used the discovery circles discussion technique (Kristo & Bamford, 2004), in which students meet in small groups to critically examine nonfiction books about a similar topic.

Students gathered their chosen books and inquiry notebooks and assembled in groups designated as Wetlands life below the water, Wetlands life on the surface of the water, or Wetlands life at the shore. Groups sat in tight circles on the floor with their books, enthusiastically sharing photographs and reading short fact-filled passages and fascinating captions they had bookmarked. Students demonstrated a sense of academic belonging within a community of learners who listen to and respect one another’s ideas.

Each group shared their findings with the whole class, and new information was added to the GVM. The teacher strategically added curriculum content at the point of relevance as a contributing participant. The language chart was used to portray a variety of other wetlands relationships.

**Step 3: Select and Synthesize Knowledge—Support Autonomy**

**Characteristics of Step 3 of the Learning Workshop.** To support emerging individual interest, students may initially work with others who share an interest. Soon, students engage in independent explorations, choosing from multiple sources of information to address the scenario. Conferring is essential as students read and write from increasingly complex texts, including online sources. Timely apprenticeship in the skills needed to meet the learning challenge keeps students in flow. Students use academic language and core vocabulary to synthesize information and express knowledge.

**How Teachers Implemented Instruction in Step 3.** Referring to the text structure of the GVM, teachers re-engaged students with the big idea questions and learning goal of the inquiry. To promote independence, teachers used several books from the text set to model the reading/writing/thinking process of selecting and synthesizing information. Students returned to the text set for a targeted search for information about their chosen area of expertise.

With teacher guidance, some student-selected topics included animals with specialized feet, a variety of food chains, breathing and seeing underwater, meat-eating plants, the importance of bugs, underwater plants, how animals survive in the winter, predators, unusual wetlands life, plant-eating animals, why plants on the shore are important, animals that hibernate, the four kinds of wetlands, and animals that live both underwater and on the shore. Time and guidance were provided to students as they read, chose, and recorded information in inquiry notebooks.

We noted that our second-grade students quickly embraced and grappled with increasingly complex texts due to the confidence they had gained through vocabulary and academic language interaction. The teachers had consciously helped students “work up to reading” complex texts with GVM support.

Teachers noted a generative learning orientation as students actively worked toward individual goals, took control of their own learning while exploring the text, and enthusiastically immersed themselves in meaning-making.

**“Individual interest sustains engagement as students use academic language and vocabulary to synthesize from multiple sources and critically use knowledge to address a real-world issue.”**
“Because semantic, morphologic, syntactic, and pragmatic systems of language are pathways to meaning, we examined evidence of language development through each of these lenses.”

discourse with peers. The interactions of these young scientists demonstrated high levels of enjoyment, concentration, and interest, which are the ingredients for engagement (Shernoff & Csikszentmihalyi, 2009).

Students met again in their discovery circles to share new information. Because the discovery circles technique emphasizes a critical examination of nonfiction content, students were directed to talk about how a plant or animal was suited for a particular layer of the wetlands environment.

When the whole class came back together, students organized new findings on the GVM. Discussions demonstrated increased schema development and vocabulary acquisition:

**Ashley**

Some trees and plants adapt to the wetlands. They have roots that stick out of the water to get oxygen. They are cypress trees and mangroves.

**Brian**

Beavers have long, sharp teeth so they can cut plants and build a dam in the wetlands. They can see through their eyelids so they can see under the water and protect their eyes.

**Step 4: Generate and Demonstrate Knowledge—Support Critical Literacy**

**Characteristics of Step 4 of the Learning Workshop.** To further enhance individual interest and engagement, students are immersed in cognitive discourse for a specific purpose. Students use increasingly complex academic language and vocabulary. By critically using information to address a real-world issue, students reveal their academic voice.

**How Teachers Implemented Instruction in Step 4.** Individual writing for the class field guide united learning with authentic performance assessment. In a disciplinary literacy approach, students generate texts of a subject area (Moje, 2008), much like real scientists who write about the natural universe (Yager, 2004).

Teachers engaged students in the Language Experience Approach (LEA; Stauffer, 1970) to demonstrate the process of using words and language from the GVM to say, write, read back, and revise text. Students were already familiar with the routines of writing workshop and easily shifted into workshop mode to draft, revise, edit, and illustrate their individual chapters.

Final writing was copied onto 11-inch by 17-inch paper for publication in the class big book. Students demonstrated creativity and knowledge as they illustrated and captioned wetlands relationships.

The more students learned, the more passionate they became about their topics and the wetlands environment.

One teacher led a whole-class shared writing activity in which a final chapter was composed. Because critical literacy is supported through activities that emphasize the intention of a message, the teacher posed several questions for the class to discuss: “What do the authors of our books want you to know and think? Why are wetlands important? What have we learned about pollution contamination in the wetlands? As authors, what important message do you want your readers to understand?”

Consensus was reached to write the final group-authored chapter about the importance of preserving local wetlands. The teacher guided the process as students dictated each sentence. According to Gee (2004), teachers should make explicit comparisons between lifeworld and academic language. A minilesson addressed revising for word choice and reasoning with supporting evidence to evoke empathy, to persuade, and to defend an argument:

**Original**

Our wetlands are important. Sometimes wetlands get polluted. Many plants and animals live there. We should not hurt the wetlands.

**Revised**

Our wetlands are valuable and should not be destroyed. Wetlands must be protected from becoming farms, roads, and cities. Chemicals from factories have destroyed wetlands. We need wetlands...
because they clean our water and stop flooding. The wetland habitat gives a home to endangered species. Many amazing plants and animals would die without food, water, and shelter from the wetlands. Birds rest in wetlands when they migrate. People around the world get food and resources from the wetlands, such as fish and peat for fuel. People can go fishing, canoeing, hiking, and bird watching in the wetlands. We need to save the wetlands for future generations.

In the LEA process, students practice reading back their own expanded oral language. This provides a model for using rich language while writing or for preparing students to meet the linguistic demands of complex texts. To complete the publishing process, subsequent lessons included creating a title, cover art, a table of contents, an index, and a glossary.

Pathways to Meaning
In our final grade-level team debriefings, observation notes and student writing revealed that using the GVM in a Learning Workshop context promoted conceptual understanding, sustained engagement, motivation, vocabulary acquisition, and language development. Because semantic, morphologic, syntactic, and pragmatic systems of language are pathways to meaning (Angell, 2009), we examined evidence of language development through each of these lenses.

Semantic development was also heightened as students attempted specialized word choice:

Nick’s writing sample
Otters can float on the surface of the water because bubbles get trapped in the undercoat.

Morphologic development highlights small units of meaning, such as prefixes, suffixes, and roots:

Shared writing sample
Beavers are herbivores. They eat plants, leaves, bark, and twigs. Eagles are carnivores. They eat meat, like fish and small birds.

Asking students to use words from the GVM and academic language chart supported syntactic development, which emphasizes the structure of sentences to show relationships among ideas:

Kristi’s writing sample
Heron and egrets have toes that spread out so that they can walk in the muck.

Pragmatic development reveals the appropriate use of language for a situational context. We noticed that pragmatic development reflected the notion of language transfer, or purposeful use of language to explain natural phenomena:

Dylan’s writing sample in his chapter on wetlands insects:

Bugs can hide and lay eggs in the wetlands habitat. There is a lot of food for the baby bugs. Wetlands insects are dragonflies, caddis flies, and mosquitoes. Bees collect nectar from flowers in the wetlands. Beetles eat the soft leaves. Butterflies like the milkweed plants. Other animals eat the bugs, so insects are important in the wetlands food chain.

These samples suggest relationships among language systems, interaction with the GVM, and the development of a schematic system of knowledge. Additional studies might explore these relationships further.

Beyond Words
Our teachers didn’t want their students merely to know about the environment—they also wanted them to care about it. Using a GVM

“Through a disciplinary literacy approach, students enacted the work and language of scientists, developed a passionate voice, and used literacy to impact their world.”
in the Learning Workshop supported a disciplinary literacy approach in our classrooms. Students engaged in enacting the work and language of scientists and then, by taking a critical stance, expressed their own passionate academic voice, generated by their blossoming understanding and language.

We learned that when armed with scientific knowledge, even young scientists could develop academic discourse agency and use literacy as a powerful tool to understand and impact the world around them. We shared the expectation and hope that this experience would motivate a deeper individual interest beyond the classroom, cultivate value and love of the natural environment for a lifetime, and instill the belief that reading, writing, and words can be used to promote awareness and positive change.

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MORE TO EXPLORE

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- “Digging Up Details on Worms: Using the Language of Science in an Inquiry Study” by Jean Landis

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