

**Using *shelfwork* at linguistic levels of vocabulary, syntax and discourse to support language development amongst ELL students**

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**Abstract**

*This action research examines the benefits of using shelfwork with academic language supports and documents how Montessori materials and methods support students to use academic language in their writing. English Language Learners (ELLs) often face difficulties explaining concepts and writing about their ideas in core academic classes because they lack necessary vocabulary and writing confidence. Following mini-lessons, labs, and instruction, these students gained independent practice through shelfwork, which was prepared at each Wida linguistic levels: vocabulary, syntax, and discourse. This targeted, scaffolded and independent practice supported Montessori students, who are also English Language Learners, in using academic language in their writing and in doing so supported conceptual understanding and improved written communication.*

**Introduction**

The role of a teacher in the Montessori Classroom is to prepare the environment physically and emotionally and then guide each student through activities, lessons, and experiences in order to achieve personal, social and academic goals. Montessori pedagogy suggests learning is most powerful when students make discoveries on their own or together with other students. Montessori teachers therefore, must provide choices and activities to allow for all types of learners with different needs and motivations to arrive at common understandings.

Shelfwork is a tool within Montessori pedagogy that provides students with choice work that parallels content presented in lessons. Students are taught content

and concepts, attend mini-lessons to support their learning, and use shelfwork to practice and apply their knowledge. Shelfwork is hands-on, completed individually or with a partner, and incorporates visuals and manipulatives. Shelfwork activities also allow for developmental differences and include mechanisms that control student error.

Shelfwork reflects a variety of modalities such as sorting, matching, reasoning, manipulating, and assembling. Although students may choose when to do shelfwork or which shelfwork activity to use to best support conceptual understanding, shelfwork is included on a student's checklist of required expectations and is therefore attended to by all students.

Students who are also English Language Learners (ELLs) may learn social English quickly upon coming to the United States through through exposure in predominantly English-speaking neighborhoods, schools or shops. Academic language is the **language** needed by students to do the work in schools. It includes, for example, discipline-specific vocabulary, grammar and punctuation, and applications of rhetorical conventions and devices that are typical for a content area (e.g., essays, lab reports, discussions of a controversial issue). Using academic language is a struggle for most ELLs and these students often need extra support and practice to improve their academic language production. Hands-on materials to apply learning and produce written work that demonstrates understanding can be extremely helpful to English learners as well as to mainstream students. Students are able to move through the language levels of vocabulary, sentence, and discourse as they practice with shelfwork manipulatives.

Given the difficulty ELLs often face with Academic Language and written expression, how can using shelfwork in a Montessori environment, which is designed at each of the linguistic levels of vocabulary, syntax, and discourse, meet the needs of English Language Learners and increase academic language acquisition and written language development? Articles referenced and examined include studies on language acquisition in the Montessori environment, methods used to teach academic language, English proficiency tied to writing, and productive work as it is related to learning a language.

### **Review of Literature**

#### **Montessori and Language Shelfwork in the Prepared Environment**

Research shows that Montessori methods support academic language through hands-on, scaffolded material as these methods link sensory experiences and developmentally appropriate tasks to language acquisition. Sensory activities and exercises can help children learn language and retain information. Through experiences with sensorial materials, children will learn to comprehend and develop language in reading and writing (“Language Development in Montessori Education,” 2007). The Montessori method works for English language learners because “Education is not something which the teacher does, but ... a natural process which develops spontaneously in the human being” (Nichols, 1984, p. 7). However, in some instances, ELL teachers need to use Montessori’s research, ideas, and approach and adapt it to their own environment for English language learners.

Nichols (1984) found it useful to provide a corner shelf where ELL materials could be kept and from which students could retrieve lessons to do on their own after receiving some instruction. Children learn by active discovery and exploration, rather than through information passing from the teacher to the student. Students interact with their environments and use their senses to learn and retain language (Stephenson, 2001). Both classroom teachers and ELL specialists can work together to design shelfwork to enhance lessons and make work that is developmentally appropriate, engaging and effective. Content specialists can work on creating content specific shelfwork and the ELL teacher can provide language supports in shelfwork. “Once classroom teachers realize that these materials make their work easier, a spirit of cooperation between specialist and non-specialist teachers can develop ...” (Nichols, 1984, p. 15).

Language is power because students are affected in their community by their ability to communicate ideas. Students need to master the ‘tools of language’ before they can make their own contribution to society and have the full realm of possibilities that language and intellectual thought and communication offer (Stephenson, 2001). “Language made possible, therefore, is the transmission of culture and knowledge, of tradition and life, and makes possible cooperation within societies and between societies for the good of all human beings. But in order for human cooperation to reach its fullest extent, there must be clarity of thought and the power of complete understanding. It allows to all human beings the power to form a judgment based on true intellectual independence” (Stephenson, 2001, p. 90). Students see vocabulary

use as a way to belong to an academic community, to feel competent and to be able to participate in discussions (Coxhead, 2012). Maria Montessori found, through observation, that children will begin to make sense of materials, and effectively “learn” if given the time to do so (Nichols, 1984). Similarly, aspects of language can be absorbed at unconscious levels. Students can learn quickly when working independently, but teachers have to lead them first, and then give them freedom to practice through such curricular vehicles as shelfwork.

Research also shows that students are drawn to shelves and want to learn from hands-on materials. Nichols affirms through Montessori’s previous research of observing children and watching them make sense of carefully designed materials, learning will occur. Nichols (1984) found, as did Montessori, that language is absorbed at the unconscious level. By using hands-on materials and practicing with them as a continuation of the lesson, students can independently come to an understanding by being intrinsically motivated and excited by their work.

One of the biggest components of Montessori is the prepared environment. Students need a safe and comfortable environment, active learning, and multiple ways to learn in order to address their diversity (Curtin, 2006). “As immigrant students today are increasingly culturally and linguistically diverse, how teachers accommodate the needs of immigrant students and how these students perceive their own educational experiences are relevant educational issues” (Curtin, 2006, p. 42). The classroom environment should be intentionally prepared to elicit possibilities for discovery and should include accessible language for all learners. The child organizes him/herself

through their movement and the learning areas set up in the room. In Montessori classrooms, everything has a purpose and materials are presented in such a way as to fascinate learners and allow them different ways to interact with their environment. The Montessori educator's job is to prepare this environment, be the guide and facilitator of the materials, and then follow the child and observe.

However, a Montessori teacher cannot assume that students are developing language simply because of the design of their room and the use of the Montessori materials. The lessons and shelfwork have to contain added language objectives to support the vocabulary and discourse ("Language Development in Montessori Education," 2007). Students receive support through the use of the Montessori hands-on materials and can retain more language due to the sensory learning presented through experiential learning. The teacher's job is to guide the students and create opportunities for students to produce and interact with their work and community, which gives them practice communicating and building on language in all modalities; speaking, reading, writing, and listening. "The literature on effective culturally responsive instructional practices supports the use of a teaching style that is highly interactive as well as the use of cooperative groups, and individualized testing and assessment procedures" (Curtin, 2006, p. 42).

### **Interactive Teaching**

Curtin adapts James Banks' multicultural teaching behaviors and focuses on the benefits of interactive teaching. Interactive teaching is personalized, communicative, child centered, individualized, empathetic, democratic and mostly interactive (Curtin,

2006, p. 37). Students are encouraged to communicate and work together.

Manipulatives have to be mindfully selected with meaningful tasks, and hands-on activities that help students make connections by both figuratively and literally grasping the content and then communicating these understandings with their peers. Montessori adolescent students have experience using checklists that track their progress as they complete lessons, activities, and shelfwork. Together, these academic structures help students learn new material, make connections, and feel confident in expressing their thoughts and opinions in their community of learners.

A program that can support language learners is one that offers language learning opportunities through task based learning in a Montessori environment that specifically focuses on oral language development and language production. Classroom models need to provide opportunities for sufficient oral output and interaction to help support language acquisition. A Montessori environment focuses on customizing learning for each learner because of the belief that learning is individual and all students have different learning styles, skills, and interests within a classroom. Montessori teachers focus on the developmental period and observe their needs, but there is a lack of understanding and resources for language learners in our Montessori classrooms. Language learners need to also have the opportunity to work according to their specific needs and interests (Winnefeld, 2016). English language learners pick up social English quickly, but often don't have their needs met with being taught more formal academic language. Teachers should model, use supports, and design curriculum to

lay the foundation for strong academic language use while teaching conversation skills and writing skills.

Townsend (2012) explains that understanding general academic words brings students more success on tests in all content areas. Townsend's research explores the need to provide more support for diverse middle school students and English language learners. "Teachers can better support their students academic language development if they can recognize the challenging linguistic demands of disciplinary contexts and vocabulary can serve as an accessible entry point into the building of a rich understanding of the many linguistic features of academic English" (p. 498). "Given the increasing abstraction, density, and morphological complexity of words throughout the grade levels, effective instruction with academic words is particularly important" (p. 517). Kieffer and Lesaux (2010) claim that academic vocabulary intervention improves students' skills in morphology, vocabulary, and reading comprehension. But this should be done as a cognitive strategy; academic vocabulary intervention should introduce word parts systematically with opportunities for re-teaching and practice, and instruction should be explicit but situated in meaningful contexts.

Good morphology teaching uses four principles for effective morphology instruction. The teacher helps the student obtain the skills through modeling, practicing, applying, and scaffolding throughout the process. Then the teacher references ideas for teaching prefixes, suffixes, and root words. In an 18-week study, students' gains were compared with the gains of similar students who were taught a standard English language arts curriculum. "The intervention students gained about six months of extra

growth in morphology and nine months of extra growth in reading comprehension.

Teaching the morphology helped the ELLs and native English speakers become more active word learners and better comprehenders” (Keiffer and Lesaux, 2010, p. 50).

Students can use and apply morphology with card sorts. Teachers have to keep these approaches in mind as they create their shelfwork and organize their vocabulary instruction.

### **Academic Language Production**

Language acquisition in a Montessori classroom can be easily supported and included in the checklists and shelfwork, but it has to be intentional and facilitated.

Townsend explains the importance of providing opportunities in content lessons to use academic language. Townsend (2015) expands upon the three major areas of literature: functional language analysis of disciplinary language, academic vocabulary in the content areas, and the morphology of academic vocabulary.

In *functional language analysis of disciplinary language* there are “specific patterns of language and grammar, which can function to convey disciplinary meanings” (Townsend, 2015, p. 377). The language in Science, for example, has certain academic functions or skills that students can learn like cause & effect, claim & evidence, compare and contrast, and observation & inference. Students can learn these skills, linguistic features, and patterns to help them make meaningful connections to the content.

The second area of literature described is *Academic Vocabulary in the Content Areas*. If students have a general knowledge of academic vocabulary they will be more successful across the content areas. Vocabulary can't be studied in isolation, but

should be made meaningful by being aligned to purposeful activities. Students need more than just the vocabulary word to convey meaning; they need the language to explain the concept. “Building the technical and abstract understanding of academic vocabulary in science allows for students to think about and communicate disciplinary content in ways that would not be possible with lay terms or social, conversational language” (Townsend, 2015, p. 378).

The third area of literature Townsend expands upon is *The morphology of Academic Vocabulary*. Students must have morphological awareness to understand academic words and academic contexts. Morphemes are functions in language that inherently carry a great deal of meaning. There is a high frequency of morphologically complex words within academic language (Townsend, 2015). So carefully attending to morphology within academic vocabulary is especially important with respect to preparing instruction for English language learners. These three areas of literature that Townsend focused on guided this research and helped lead to the creation of shelfwork to academic language support in this study.

According to Coxhead (2012) there are two factors that affect students’ writing; the content words or language functions that could be used in academic writing and the effect an audience has on the writer. Coxhead claims that many students are “highly aware of the different tasks and lexis needed for their academic studies; and the effect of an academic audience of lecturers and peers (as well as family) on their lexical choices” (Coxhead, 2012, p. 142). Diction, or word choice, supports the tone that a writer hopes to convey and if a student doesn’t have the vocabulary needed to explain

their ideas and intent, they feel inadequate as writers and aren't able to show their knowledge on the subject. Teachers need to select vocabulary for writing, discuss appropriate word use and registers, and provide scaffolding. Practice and modeling should be considered as well as teaching how to use quotes and how to paraphrase.

Salamonson found the writing skills of first-year nursing student with limited English proficiency improved when time was taken to support these students in a study done during a workshop. The study focused on the effect of embedded academic supports while writing. Salamonson claims that the nursing students that got the intervention got much higher scores compared to the control group and students that did not. "A brief, intensive, embedded academic support workshop was effective in improving the academic writing ability of nursing students with low-to-medium English language proficiency, although reaching all students who are likely to benefit from this intervention remains a challenge" (Salamonson, 2010, p. 413).

O'Hara and Pritchard use hypermedia to help students acquire academic English vocabulary. They claim that today in schools students need to not only know how to read and write, but also how to use critical thinking and the use of technology in their learning and application of knowledge. In their research, sixth and seventh grade students were studied to investigate the impact of how authoring/using hypermedia projects affects the academic vocabulary development of ESL students. Their research suggests that students' understanding of vocabulary increased over the course of the project for the technology group. The technology group learned more about the vocabulary words than the control group (O'Hara and Pritchard 2008). Their research

shows the impact of academic vocabulary as it is related to technology and media production, but this can be tied to student application through any type of activity. Students need to produce language to synthesize and apply their knowledge.

### **Conclusion of Literature Review**

Based on the commentary of language educators across the nation, there is a need to improve student's academic language. This improvement will benefit students by giving them the tools to communicate in academic contexts and feel confident in their ability to communicate and write in educational and formal settings. English language learners (ELLs), have difficulty mastering the kinds of academic language needed to succeed in school, especially if they have never been explicitly taught the vocabulary, linguistic functions, and morphological awareness. The social, behavioral, and critical thinking skills are developed when students are challenged to use academic and content specific language. They can contribute to discussions, comprehend more challenging texts, and write in response to content specific issues in a classroom and in the real world. Shelfwork in a Montessori environment can serve as a vehicle for academic language practice if planned and implemented correctly. By preparing shelfwork at each of the language levels of vocabulary, syntax, and discourse it is possible to influence and improve students literacy and thinking.

## Research Questions

### Research Question:

How can using ELA shelfwork in a Montessori adolescent environment, which is designed and utilized at each of the linguistic levels of vocabulary, syntax, and discourse, support language development amongst English language learners?

### **Subsidiary Questions:**

1. To what extent will interaction with ELA shelfwork supporting vocabulary, syntax and discourse support ELL student growth from word/phrase dimension to sentence dimension to discourse dimension?
2. To what extent will interaction with ELA shelfwork supporting vocabulary, syntax and discourse support ELL growth in science content knowledge?
3. To what extent will interaction with ELA shelfwork supporting vocabulary, syntax and discourse support ELL growth in science writing?
4. Does providing vocabulary, content word definitions, signal words, and paragraph frames in shelfwork help student achievement when it comes to writing independently about the content?

### **Definitions and context**

This action research relies upon the pedagogical tools, often modeled in Montessori adolescent settings:

- **Shelfwork** is a Montessori method where students go to the shelf and pick an activity assigned to practice the content that is being presented in lessons. It is usually an activity done individually or with a partner, is hands-on, and provides

visuals and manipulatives. Shelfwork reflects a variety of modalities with activities that involve sorting, matching, reasoning, manipulating, and assembling. Shelfwork is included on the checklist and provides life skills activities, reasoning and logic activities, literacy activities, and sensorial activities. See Appendix A

- **Checklists** are a Montessori tool that students use to keep track of their learning and their completed tasks. Students receive a checklist at the beginning of a 2 week period and check off lessons they attend, activities and shelfwork they complete, and project components they finish. The checklists are evidence of some choice for students with clear limits and guidelines. This is apparent in the independence and respect with which the students conduct themselves within the classroom, as well as some choice in the work a student attempts (this does not mean the student chooses alternative assignments that are not planned by the teacher or chooses not to work). Checklists show differentiated work and work that is done most often without the teacher. See Appendix C
- **Status of the Class**: Montessori teachers often use a “status of the class” check-in for the teacher and students to communicate the activity they are working on and what they may or may not need support on in a mini-lesson or check-in with the teacher. The different activities and work that are assigned on the checklist are also written on the whiteboard or status of the class chart. Students move their magnet on the whiteboard (or the teacher checks off their status in their record keeping status of the class) to the activity they were working

on whether it be an assignment from the lesson, a part of their lab, or the shelfwork practice. If a student needed help with any of these checklist items they move their magnet to “requesting a lesson” or “check-in” column and then the teacher knows to give that student extra support. See appendix B

## **Research Design and Methodology**

### **Participants, Timeline and Setting**

This action research was conducted in a public, urban adolescent Montessori School in the upper midwest. Participating students were 7th and 8th graders in a combined Life Science classroom. As this school belongs to a larger public district, a standards-based district wide curriculum is in place. However, given the Montessori setting, academics rely heavily upon independent inquiry and are rooted in each student’s interests and learning style. The school demographics are reported as 31% Asian American, 30% African American, 22% Caucasian, 15% Hispanic, and 2% American Indian. The school has about 30% English language learners, which are mainstreamed in their classes. Participants of Diverse ethnic and language backgrounds were used in order to look at academic language needs. The focus was on 15 students identified as ELL (English language learners). They are identified ELL by a HLQ (home language questionnaire) and a score below 6 on the ACCESS test. Data collected for this action research was collected over a span of four weeks. Parent consent forms were distributed and returned prior to data collection.

The Montessori classroom provides a setting where the students are challenged, motivated, and engaged so before assigning the checklist and shelfwork care was taken in the arrangement of the room. The students' work is supported by the layout of the Montessori classroom, which is set up to elicit student interest and to provide the opportunity to work in calm, organized spaces either individually or as part of a group. During the shelfwork activities and extended work time students can work at their tables, get a carpet square so they can sit on the floor, or sit in a comfortable chair in a different part of the classroom. The classroom is organized, inviting, and thoughtfully arranged.

The classroom is prepared so that students can be independent and have freedom within limits. The student can go to the shelf for the materials and know what to do and how to do the shelfwork independently because instructions are provided and the students know the routine. There is a control of error so that students can check their work and further practice. The student makes use of what the environment offers and have uninterrupted work time when choosing their activity and completing tasks assigned on their checklist. Students are learning by active discovery and exploration, instead of the traditional classroom of lecture and note taking. The student interacts with the environment and the materials. Figure 1 below shows the area where the shelfwork is located. Students go to the shelf and pick up the activity they want to do and then replace it in the exact way they found it when they are done. Figure 2 also shows an area where shelfwork is kept. Figure 3 shows a word wall, which is another

support students have to use in their work space and is often helpful for students to look at during their writing shelfwork activity.

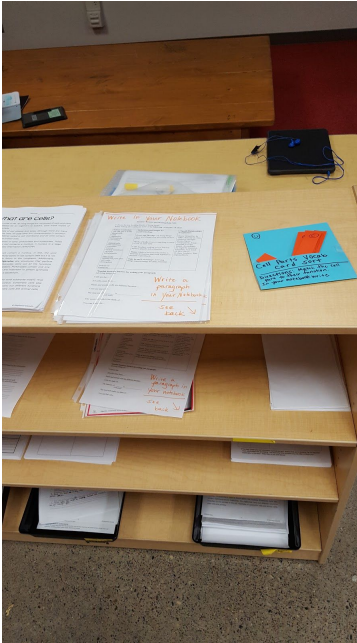


Figure 1: Shelfwork

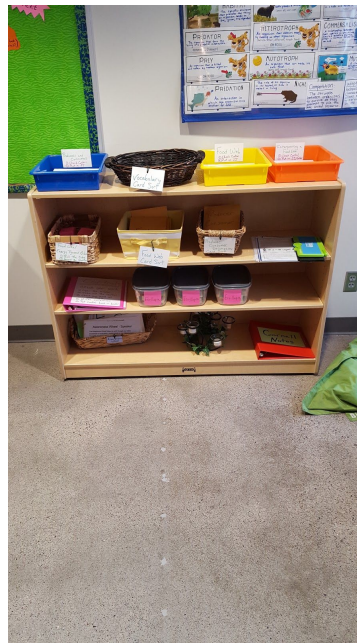


Figure 2: Environment

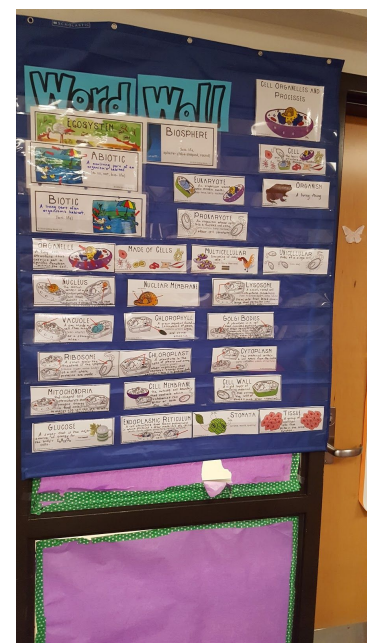


Figure 3: Word Wall

### Procedures and materials

A permission letter was sent home in the first week of December to all the parents/guardians of the students in the classroom informing them of the research project and what teachers hoped to learn. The students in the study are on a Multi-Language Learner caseload and received the same instruction as the rest of the students in the class. A district list was used that identifies students' MLL level based on their ACCESS test score and home language. The same shelfwork materials were provided to all the students, but for research purposes only the 15 MLL students' scores were used for the data collection and to inform research. The information gathered was only from school assigned activities that were on students' checklists.

After the consent forms were received students were assigned a writing pre-test. The pre-assessment contained a writing prompt about the Science content they were studying. They did this before completing the shelfwork on their checklist. 15 student samples were kept for research and the WIDA writing rubric was used to score their linguistic level. All shelfwork was created ahead of time and then put on the designated shelf in the classroom for students to complete when they had time in their extended work period. This was done during a 4 week window because students received two checklists with these assigned tasks and these could be done when the student chose to complete them and when there was opportunity. There was no direct instruction for the shelfwork because shelfwork is meant to be done independently.

In the month of data collecting students continued learning about cells and the energy pyramid and were assigned work with activities related to these topics on their checklists. Students completed the shelfwork at their own pace and three of their assigned shelfwork activities were designed to practice academic language when talking and writing about cells or the energy pyramid. Students checked off completed shelfwork on their checklist and were allowed to do it again for more practice.

Shelfwork was completed on two checklists and was made with content and language objectives in mind:

1st. Vocabulary level- A vocabulary card sort: students matched the vocabulary term to the definition, and then wrote down a definition with their own words in their notebook.

The vocabulary was content specific to their lessons about cells or the energy pyramid.

See Figure 3 below.

2nd. Sentence level- Large Question Dice: Students were provided with dice that have questions associated with the science content of cells or the energy pyramid. They rolled the dice and had to answer the question in their notebook with a complete sentence. See Figure 4 below.

3rd. Discourse level- Paragraph frame with designated vocabulary: Students received a laminated sheet with a vocabulary box and sentence frames. Students had to write a paragraph using the vocabulary listed and can use the sentence starters to help construct their paragraph. Students wrote in their notebook and took a picture with their Ipad as evidence of their work. The paragraph was about the content being covered in science. See Figure 5 below.

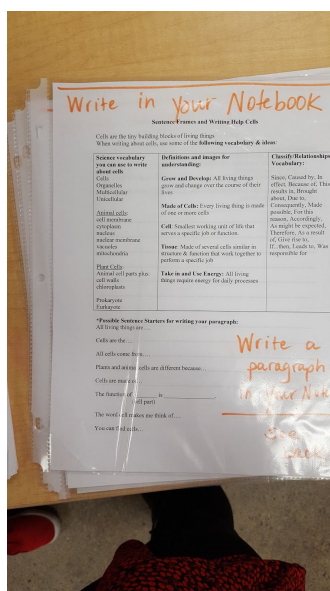
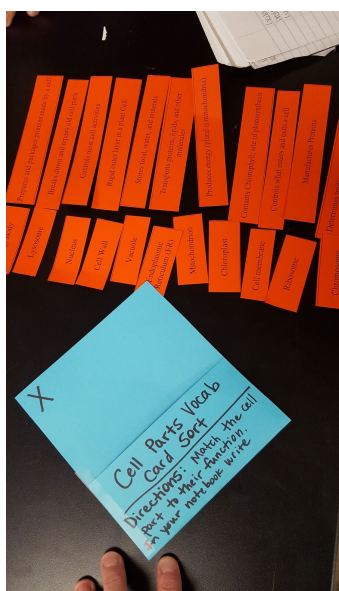


Figure 3: Card Sort

Figure 4: Dice Cubes

Figure 5: Paragraph frames

In the vocabulary card sort students had 10 science vocabulary words related to either cells or energy in an ecosystem. They spread the vocabulary words out on their desk and then had to look through the strips of paper and match the vocabulary work with the correct definition. When they felt that they completed the card sort correctly, they took a picture with their Ipad and then went to the board to get the “control of error” paper and checked to see if theirs matched the control. If it didn’t match they fixed their errors and then put the cards back in the envelope and returned it to the shelf. Students then took out their checklist and put a check in the box next to the vocabulary card sort for completing the task.

In the dice cube shelfwork students went to the shelf to get a cube made from card stock with six sides similar to dice. Students had to roll the dice four times and each time write down the question in their notebook and then answer it in a complete sentence. When writing the answer students have to restate the question by putting the question in their answer (also known as PQA). Students were encouraged to complete this task with a partner so that they practiced the questions orally. Some of the questions about the energy pyramid were “How does the energy pyramid show the flow of energy?” and “What are some examples of primary and secondary consumers?” Students also had dice cubes about cells containing questions like “What organelles do plant cells have that animals cells do not?” or “What function does the \_\_\_\_\_ organelle have in the cell?” Students kept these questions and answers in their

notebook or took a picture with their Ipad as evidence of their work. When completed they took out their checklist and checked off their completed shelfwork task.

The laminated paragraph frame shelfwork was another activity that had to be completed in the four week window. Students brought the laminated sheet to their desk or chosen area and worked independently to write a paragraph using the three columns of science vocabulary, definitions and images for understanding, and signal words for classifying and describing. The laminated sheet also provided possible sentence starters for help in writing the paragraph. With the energy pyramid writing prompt students had to think about how systems in nature have a careful balance that is maintained by many participants and then write about their knowledge of the energy pyramid using their designated vocabulary. When using the cells writing prompt students had to write about their knowledge of cells using the targeted vocabulary. When they completed this paragraph they took out their checklist and checked off their completed task.

Throughout the process shelfwork samples were collected as students completed their tasks. At the end of the study students took a post writing assessment on cells and the energy pyramid. Students were given the same writing prompt as the pre-test after having practice with the use of the shelfwork on their checklist. Their first paragraph was compared to this final writing assessment for data using the WIDA rubric for scoring. The completed writing samples were looked at for evidence of some of the structures, signal words, sentence starters, and paragraph frames students used during

their shelfwork practice. The assessment was designed to look similar to the pre-assessment except without the paragraph frames, vocabulary boxes, and sentence starters. See Appendix F & G for examples.

After the post assessment, interviews were conducted with students about their experiences with writing and using academic language to write about particular topics. Students answered questions both orally and in writing to help inform the research. The interview was conducted one on one and felt more like a discussion. The interview took place in an empty familiar classroom nearby so students seemed comfortable. All students readily shared information, but some shared more orally because it was easier for them to explain their feelings that way.

### **Analysis and results**

This action research utilized quantitative analyses by scoring students science writing both before and after the use of the shelfwork. Qualitative analyses was used through student interviews about writing experiences and through observations of the shelfwork activities. Quantitative analysis utilized the WIDA, which is an instrument designed to advance and assess academic language development and academic achievement for children and youth who are culturally and linguistically diverse through high quality standards, assessments, research, and professional learning for educators. Qualitatively, the researcher relied on observational notes and examples of student work to inform results.

The WIDA is an instrument used to score students language use in academic contexts (See appendix item 1). WIDA draws on multiple theories and approaches in an effort to describe language use in academic contexts; this is the language that language learners must acquire and negotiate to participate successfully in school. These multiple theories and approaches form a theoretical foundation that supports the WIDA standards framework.

The standards framework consists of five components. Some of these components are expressions of a particular philosophy, while others are explicit representations of knowledge. The five components are:

- Can Do Philosophy
- Guiding Principles of Language Development
- Age-appropriate Academic Language in Sociocultural Contexts
- Performance Definitions
- Strands of Model Performance Indicators

<https://www.wida.us/standards/eld.aspx>

The quantitative research comes from the comparison of scores using the WIDA's 6 point writing rubric from students' initial writing on the cell or ecosystem paragraph to their final scored paragraph. The results for the final writing prompt and academic language use for the class as a whole was quite positive as evident from the results shown below in figures 6 (Cell Paragraph Comparison) & Figure 7 (Energy Paragraph Writing Comparison). The first bar graph shows results from the Cell paragraph pre-test score in blue and their post test score in red For students to get a 6

on their paragraph they had to show linguistic complexity, precise and technical vocabulary, and show language control.

Figure 6

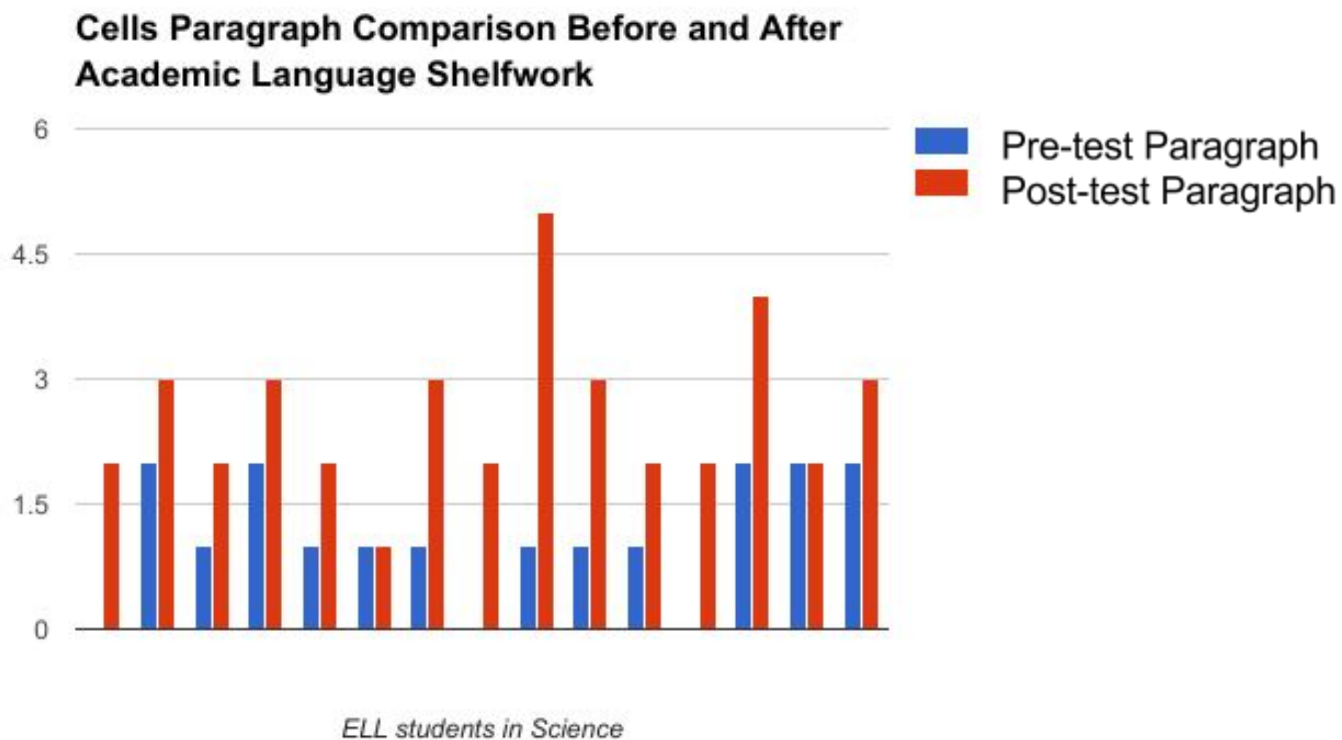


Figure 7

Pre-test Paragraph  
Post-test Paragraph

The average score was a 1.13 on the Cell paragraph pretest (blue) and a 2.6 on the post paragraph test (red). The Energy Pyramid writing assessments scores had an average score of 1.06 on the pretest (blue) and 3.2 on the post-test (red). Many students received 0's, 1's, and 2's on their pretest because they didn't know how to begin and didn't have enough vocabulary to describe and classify. Students didn't have the language to express their understanding of cells and ecosystems before the use of the shelfwork. The shelfwork gave students sentence starters and the correct forms and functions they needed to answer the prompts. Students also had practice through repetition of the word use and memorization of the vocabulary. Students gained a sense of how to classify information and describe using the visuals, word definitions, and language forms and conventions. Students have used sentence starters and academic language bubbles on other assignments, but by including it in the shelfwork it becomes common practice and support that is built in for them to use independently. The language use then becomes more immediate and comfortable. Students no longer need to be told to use formal language or to include the academic language. They have the skills to use critical thinking and the language to communicate these ideas and their understanding.

The qualitative research comes from observations of student progression on their shelfwork in the four week period, which provides practice in the area of academic writing in relation to the content of human and animal cells and energy in an ecosystem. Qualitative documentation was obtained through student interviews, which gathered information about students' language learning background, their feelings on writing in

school, their writing levels, and their experience using the shelfwork in the study. See in appendix figures 5, 6, and 7. Student growth was measured qualitatively by asking them directly about how the shelfwork aided their writing.

The students had a positive response overall to the use of the shelfwork. Many students wrote about their difficulty writing in science because they don't know what to say and the described the words as being "hard". One student wrote that the paragraph frame shelfwork helped him "put higher levels of words while I write." Another student said that the vocabulary card sort helped her "learn how to write new words" and "it helped me more with understanding." I had another similar response from a student that the vocabulary card sort "helped me a lot understand new science words. It helped me memorize which word goes with which meaning." She said the paragraph shelfwork helped her because "I couldn't remember how to spell all the types of cells and the sentence starters helped me know what to write about." The dice cubes helped me "know what questions I need to answer about the science we study." The paragraph frame "helped me practice writing paragraphs and write about what the teacher wants me to write about."

### **Interpretations/Discussion**

The data tells me that students benefit from the practice of academic language shelfwork. The success of the knowledge gained by completing shelfwork tasks lies not in simply knowing definitions of words, but in knowing what those words mean and how they are used in academic contexts. The vocabulary card sort was assigned to help

students practice content vocabulary words with their definitions. This gave students another opportunity to review cell organelles and words associated with energy in an ecosystem with their meanings so that they are familiar enough to use this content specific vocabulary in other activities and discussions in class. Before students can be asked to use science vocabulary in their writing, they have to know the basic terms and their definitions by practicing it and using the vocabulary multiples times. Manipulating a card sort is a more creative and interesting way to practice vocabulary terms, which helps students retain the meaning by engaging more than one sense at a time.

The dice cubes were designed to help students practice their sentence level grammar (Syntax). Students can practice their verb tense and sentence structure while answering content specific questions. Many students struggle to write complete sentences and don't have as many opportunities to do so in the science classroom. Students found the bright cubes fun to play with and roll, and it looked more like a game than work. By creating the cube it was more inviting to students to answer the science questions rather than if it was assigned from a worksheet. Students are better able to recall their experience answering questions about how energy moves through an ecosystem from this activity than when they were simply taking notes on the topic.

The paragraph frame shelfwork is more inviting than a worksheet because it is laminated, shared, and an item they can check-off when completed. Students can write notes on the laminated sheet with an expo marker or circle vocabulary they want to use. Students felt confident in their writing because they were given vocabulary to use, had definitions for some of the more difficult content specific terms, and had vocabulary

provided for classifying relationships and describing functions. Students felt successful because they were given the tools to write a paragraph with these supports. By completing this shelfwork students can learn to eventually write about their knowledge of ecosystems and cells without these scaffolds. If students are expected to write about specific content understandings, we need to make sure that we are helping them build important academic language skills in addition to the more obvious vocabulary and grammar forms. Students weren't learning content simply by taking notes; they needed to produce or have output in order to interpret features of academic language as they read or listened to texts, as well as while they discussed and wrote about information.

The interviews show how students feel about writing and shelfwork. A student said she liked the language shelfwork because "I know what to say and I'm not scared to write." One student said that writing well is important because "writing is a subject that you will need your whole life." Another student said "I love writing, writing is something that I can express myself with, but my grammar and spelling bother me." She also said that the vocabulary dice helped her because "it help me whenever I learn vocabulary by using them in a sentence." Without sentence starters and clear instructions students sit there and can't get started with their writing. By providing some way to start students have a clear vision, but the difficulty with this support is when it has to be taken away. Students can tend to rely on it too much, which was evident in some of the shelfwork practice. But by having the paragraph frames as part of the shelfwork it can be used as an independent tool and not a step they will always have in place during independent writing time.

The data tells me that there was definitely benefits from the shelfwork. Students had ample opportunities to learn and practice the language and content. As illustrated in the bar graphs above, on average students improved their writing score by 2 points on the WIDA writing rubric.

### **Conclusion/Discussion**

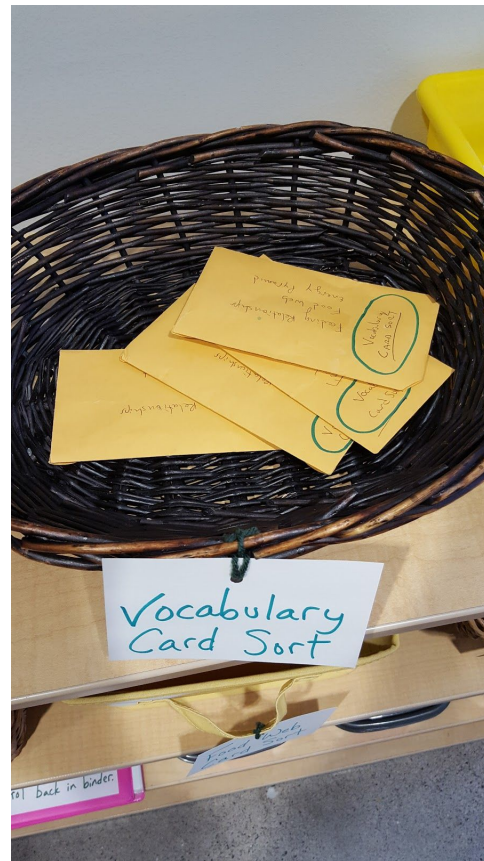
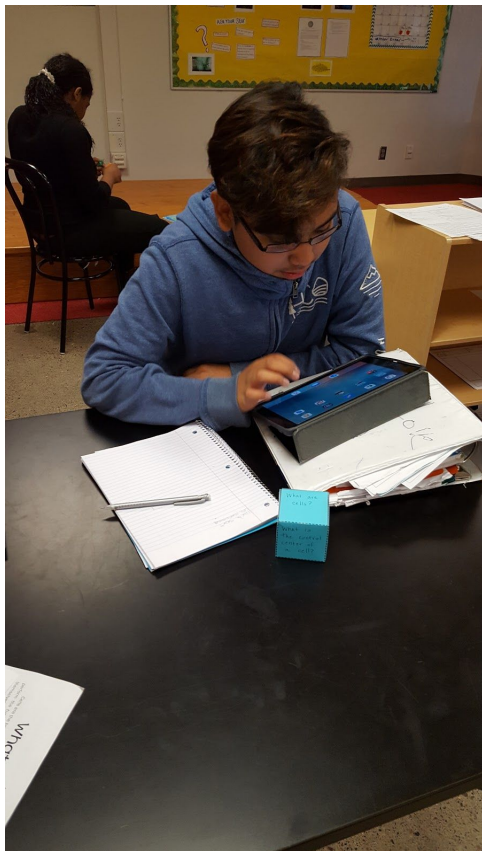
The central question in this research was how using shelfwork in a Montessori environment, which is designed at each of the linguistic levels of vocabulary, syntax, and discourse, could meet the needs of English language learners by increasing their written language acquisition and academic language development.

Often times teachers appreciate English language learners because many of the students are well behaved and hard workers. Some students seem to be doing well because they are agreeable and have learned to cope with some of their language difficulties by being silent and unnoticed. However, when students don't produce their knowledge on the subject matter they aren't learning and it is impossible for teachers to know what they know. Students aren't able to explain their understandings even if they do comprehend because they haven't practiced this output. Through oral and written production of student knowledge, students are able to showcase their learning and build on this knowledge. But, they have to be given the tools to speak and write their thoughts. The more students have these text structures and opportunities to practice this output, the more successful they will be in all of their classes and in life. Students aren't simply sponges and just soak up information in a lecture or as they are told. They need to interact, discuss, and produce to truly understand. Using shelfwork in a

classroom that provides academic language supports is extremely helpful to English learners because they can use the hands-on shelfwork materials to practice what they have learned and produce written work that demonstrates their understanding.

Students need access to academic word knowledge for academic success.

### Appendix A: Shelfwork Activities



Appendix B: Status of the Class

The whiteboard chart is titled "Status of the Class" and is organized into several columns. At the top, there are labels for "Mr. Dong" and "Ms. Jenny". The columns are: "Name", "Microscope & Cell Theory Schoology", "Lab Investigation", "Dice Cube", "Cell paragraph", "Versatiles cells", and "Vocab card sort". Each column has a vertical green dotted line. Student names are written on blue sticky notes and placed within the columns. To the left of the chart, there are handwritten notes including "3 day", "m list:", "stigation", "Cell Project", "h", "function", and "tion". To the right, there is a TV screen displaying "Air" and "Wirelessly send computer to the".

Name	Microscope & Cell Theory Schoology	Lab Investigation	Dice Cube	Cell paragraph	Versatiles cells	Vocab card sort
Oscar		Aaron				Mike
Jessica		Michael				Anna
Bernardo		Benjamin				John
Lavonte		David				Leslie
Fernando		James				
Mario		Joseph				
Roselio		Anthony				
Sadie		Samuel				
Jonathan		Sam				
		Sam				

Appendix C: Checklist example

Cycle 2: Systems

Week 2-3

	Shelfwork and Work plan	Exit Ticket Complete the question or prompt for each day of the week.
Monday	<ul style="list-style-type: none"> <li><input type="checkbox"/> Read textbook pages 740-741 and do Cornell Notes (Put in Turn-In-Bin)</li> <li><input type="checkbox"/> Vocabulary 4-Squares (Put in SJ)                             <ul style="list-style-type: none"> <li><input type="checkbox"/> Producer</li> <li><input type="checkbox"/> Consumer</li> <li><input type="checkbox"/> Decomposer</li> </ul> </li> <li><input type="checkbox"/> Eco-llapse Game worksheet</li> </ul>	Monday/Tuesday: What are the relationships between producers, consumers and decomposers?
Wednesday	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lab activity</li> <li><input type="checkbox"/> Read Food Chains and Webs (handout OR on Schoology)</li> <li><input type="checkbox"/> Food Webs Activity lab</li> <li><input type="checkbox"/> Classroom Energy Web</li> </ul>	Wednesday/Thursday: How do organisms rely on each other in a food web?
Friday	<ul style="list-style-type: none"> <li><input type="checkbox"/> Classroom Food Web</li> <li><input type="checkbox"/> Classroom Food Web Questions (Put in Turn-In-Bin)</li> <li><input type="checkbox"/> Energy Dice Cubes</li> </ul>	Friday/Monday: Draw an example food web. Include the SUN, 1 producer, 4 consumers, 1 decomposer

Tuesday	<input type="checkbox"/> Energy Pyramid worksheet (Check Control and Put in SJ) <input type="checkbox"/> SW: Energy Pyramid paragraph (Put in Turn-In-Bin) <input type="checkbox"/> Create an Energy Pyramid for your Classroom Food Web	Tuesday/Wednesday: What is an energy pyramid? How does a food pyramid show the flow of energy?
Thursday	SHELFWORK: <input type="checkbox"/> Vocabulary Card Sort <input type="checkbox"/> Producer & Consumer Card Sort <input type="checkbox"/> Food Web Versatiles <input type="checkbox"/> Energy Pyramid Task cards <input type="checkbox"/> Food Web/Energy Pyramid Cube	Thursday/ Friday: What shelfwork did you complete this week? What do you need to review?

GO BEYOND THE MINIMUM:

- Create a Mini-poster using examples of the following: Producer, Consumer, Decomposer
- Create a Mini-poster using examples of the following: Herbivore, Carnivore, Omnivore, Scavenger
- Complete Energy Pyramid Schoology assignment on your Ipad

Standards:

7.4.2.1.1 Identify a variety of populations and communities in an ecosystem and describe the relationships among the populations and communities in a stable ecosystem.

7.4.2.2.1 Recognize that producers use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.

7.4.2.2.3 Explain that the total amount of matter in an ecosystem remains the same as it is transferred between organisms and their physical environment, even though its form and location change. *For example:* Construct a food web to trace the flow of matter in an ecosystem.

7.4.2.1.2 Compare and contrast the roles of organisms with the following relationships: predator/prey, parasite/host, and producer/consumer/decomposer.

7.4.2.1.3 Explain how the number of populations an ecosystem can support depends on the biotic resources available as well as abiotic factors such as amount of light and water, temperature range and soil composition.

Appendix D: Wida Writing Rubric

<b>Writing Rubric of the WIDA Consortium*</b>			
<b>Grades 1-12</b>			
<b>Level</b>	<b>Linguistic Complexity</b>	<b>Vocabulary Usage</b>	<b>Language Control</b>
<b>6 Reaching</b>	A variety of sentence lengths of varying Linguistic complexity in a single tightly organized paragraph or in well-organized extended text; tight cohesion and organization	Consistent use of just the right word in just the right place; precise Vocabulary Usage in general, specific, or technical language.	Has reached comparability to that of English proficient peers functioning at the "proficient" level in state-wide assessments.
<b>5 Bridging</b>	A variety of sentence lengths of varying Linguistic Complexity in a single organized paragraph or in extended text; cohesion and organization	Usage of technical language related to the content area; evident facility with needed vocabulary.	Approaching comparability to that of English proficient peers; errors don't impede comprehensibility.
<b>4 Expanding</b>	A variety of sentence lengths of varying Linguistic Complexity; emerging cohesion used to provide detail and clarity.	Usage of specific and some technical language related to the content area; lack of needed vocabulary may be occasionally evident.	Generally comprehensible at all times, errors don't impede the overall meaning; such errors may reflect first language interference.
<b>3 Developing</b>	Simple and expanded sentences that show emerging complexity used to provide detail.	Usage of general and some specific language related to the content area; lack of needed vocabulary may be evident.	Generally comprehensible when writing in sentences; comprehensibility may from time to time be impeded by errors when attempting to produce more complex text.
<b>2 Beginning</b>	Phrases and short sentences; varying amount of text may be copied or adapted; some attempt at organization may be evidenced.	Usage of general language related to the content area; lack of vocabulary may be evident.	Generally comprehensible when text is adapted from model or source text, or when original text is limited to simple text; comprehensibility may be often impeded by errors.
<b>1 Entering</b>	Single words, set phrases, or chunks of simple language; varying amounts of text may be copied or adapted; adapted text contains original language.	Usage of highest frequency vocabulary from school setting and content areas.	Generally comprehensible when text is copied or adapted from model or source text; comprehensibility may be significantly impeded in original text.
<b>*For use with the ACCESS for ELLs® test, the W-APT, and formative/classroom assessment in WIDA Consortium states.</b>			

Appendix E: Student interview responses

Writing Levels

4. What do you find most difficult about writing? What makes writing in English the most difficult? *sometimes is difficult when they want a perfect paragraph*

5. What helps you write better? *when a teacher is sitting by me helping me out*

6. When you write, do you use word walls, dictionaries, or glossaries to help you write? Describe how this could help you.

7. Do you feel comfortable writing complete sentences? Why or why not? *no because I don't really like writing*

8. Do you use sentence starters and/or sentence frames when you write? Describe how this could help you. *yes. Because sometimes I don't know how to start and then I use those frames me they be helping me out*

9. Do you think writing well is important? Why or why not? *because*

10. Does the topic of your writing make a big difference to you? Do you have a harder time writing in science about science topics than in other classes? *because I don't like science. yes because I really struggle with science*

11. You used science words in your writing that you have been learning in class. Did you know the words at all before you used them? If you did, how well did you know them?

...and the new science words? Did

...complete sentences? Why or why not? *Sometimes because at times it can be hard.*

Do you use sentence starters and/or sentence frames when you write? Describe how this could help you. *Sometimes because sometimes I feel like too.*

Do you think writing well is important? Why or why not? *yes, it can help you with your future.*

Does the topic of your writing make a big difference to you? Do you have a harder time writing in science about science topics than in other classes? *yes, because sometimes science can be hard. there's like words that I know but I don't*

...used science words in your writing that you have been learning in class. Did you know the words at all before you used them? If you did, how well did you know them? *Yes, its like if I don't know, I go back and look. always know the meaning.*

...the vocabulary card sort help you understand the new science words? Did it help your writing? *I feel like I don't quite understand.*

...question cubes shelfwork help you write and practice complete sentences about your science content? Did this help you understand? *yes a little bit*

## Appendix F: Student Writing Final Assessment Energy Pyramid

Energy Pyramid Writing Assignment

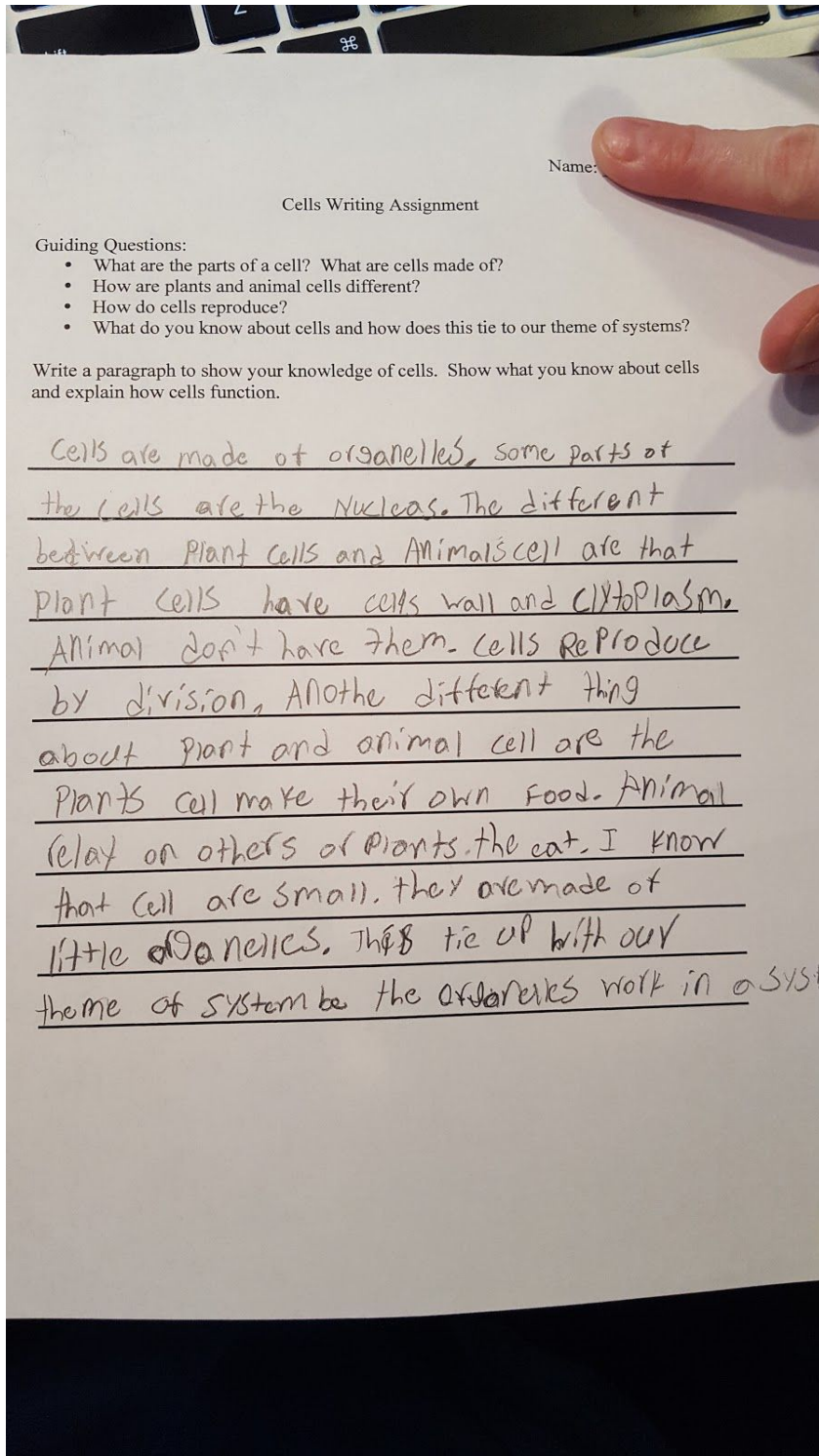
Guiding Questions:

- ✗ How do parts of an ecosystem interact?
- ✗ What is the relationship between producers, consumers, and decomposers?
- ✗ What is a food web?
- ✗ What is an energy pyramid?
- How does energy flow in an energy pyramid?

Write a paragraph to show your knowledge of producers, consumers and decomposers. Show the knowledge of an energy pyramid and explain how **systems** in nature have a careful balance that is maintained by many participants.

The ecosystem is everyone in one place together. The relationship between producers, consumers and decomposers is producer makes their own food so consumers can eat them then consumers decompose their food. A food web is a web like the producer, consumer, and decomposers. A energy pyramid is a pyramid. It's an plant, that an animal eat, then a bigger animal eats that animal.

## Appendix G: Student writing Final Assessment on Cells



Name: \_\_\_\_\_

Cells Writing Assignment

Guiding Questions:

- What are the parts of a cell? What are cells made of?
- How are plants and animal cells different?
- How do cells reproduce?
- What do you know about cells and how does this tie to our theme of systems?

Write a paragraph to show your knowledge of cells. Show what you know about cells and explain how cells function.

Cells are made of organelles, some parts of the cells are the nucleus. The different between plant cells and animal cell are that plant cells have cell wall and cytoplasm. Animal don't have them. Cells reproduce by division. Another different thing about plant and animal cell are the plants cell make their own food. Animal rely on others of plants. the cat. I know that cell are small. they are made of little organelles. This tie up with our theme of system be the organelles work in a system.

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