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Learning through meaningful experiences with self, others, and the environment: A curriculum framework tailored to the needs of English language learners

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Learning Through Meaningful Experiences with Self, Others, and the Environment:
A Curriculum Framework Tailored to the Needs of English Language Learners

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Our current education system is, in many cases, failing the most vulnerable among us, including, but not limited to, the impoverished, immigrants, and nonnative speakers of English. According to the National Education Association, English Language Learners (ELLs) are the fastest growing student population in the public school system while they simultaneously experience disproportionately higher instances of poverty – about two-thirds of these children come from low-income families. Moreover, these students experience academic success at much lower rates than their native-speaking peers (2008). Thus, it is crucial that curricula begin to focus on improving the educational experiences of these students so that *all children* may have the opportunity to succeed. In fact, this is the primary aim of this curriculum.

Within this framework, the following aspects are outlined as they relate to the context of an inclusive, 21st century general education classroom with English Language Learners: an overview of influential pedagogical philosophies, broad educational goals for students, sample unit summaries and lesson plans, and evidence-based assessment practices. In the eyes of the author, both the content of a curriculum and its impact on student learning should be considered prior to implementation.

Content: What will this curriculum teach students?
The purpose of this framework is to provide a culturally and linguistically diverse student body of elementary school students with an interdisciplinary, hands-on, experiential, project-based learning experience, which will foster an environmentally conscious study of place value while simultaneously encouraging an exploration of meaningful connection to self and others.

Impact: Why is this curriculum significant?
In a globalized world, valuing the cultural and linguistic background of all students is becoming increasingly important within educational communities, particularly in the United States. In 2013, nearly one-quarter of the American population, about 80 million people, was either first- or second-generation immigrants, and that number is steadily rising (Zong & Batalova, 2015). Therefore, schools need to be prepared to provide for this ever-

growing population of diverse young students with a first language other than English. The first step in this process is creating a curriculum that supports the integration of these students into the general education classroom, an environment where there may be frequent opportunities for these students to interact with native speakers of English and for invaluable exchanges between students from diverse backgrounds.

Acknowledgments

I owe the existence of this project to the continuous support, guidance, and knowledge of the following remarkable individuals and institutions.

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A Brief Overview of Influential Pedagogical Philosophies

Teaching English Language Learners (ELLs) from varied cultural backgrounds involves strategies that go a step beyond standard instruction. Initially, it includes an abundance of visual supports, realia, and connections to students' first languages. However, an optimal learning environment for ELLs, and most learners in general, is one that is hands-on, project-based, and revolves around meaningful educational experiences. In order to make learning meaningful for ELLs in particular, instruction should be culturally relevant, or, in the words of Gloria Ladson-Billings, instruction should promote academic success, utilize students' cultures as a vehicle for learning, and empower students to critically analyze societal inequities (1995); this is especially important when a school serves students of differing ethnicities, languages, and cultural experiences.

Experiential learning, or "learning by doing," involves the student as an active participant in his or her own learning through valued interactions with self, others, and the immediate environment (Association for Business Simulation and Experiential Learning, 1990). Within a classroom where experiential learning practices are supported, a cooperative learning environment naturally forms and allows for collaboration and positive interactions between students of all levels and backgrounds. This method of shared learning has been proven to be particularly effective for ELLs because it supports natural and meaningful face-to-face verbal communication (Northwest Regional Educational Laboratory, 2003). In addition, experiential learning embodies aspects of project-based pedagogy that also promote valuable, hands-on educational opportunities. The model of project-based learning involves mainly student-led tasks that incorporate problem-solving techniques, cooperative learning, and the creation of genuine, real-world products (Autodesk Foundation, 2000). Additionally, it should be noted that a vital feature of all aforementioned pedagogical methods is their focus on active engagement. When a student is actively engaged in a task or subject, he or she experiences increased brain stimulation, motivation, attention, and even oral language development, and this can be particularly vital for ELLs within the classroom (Echevarria, Vogt, & Short, 2014).

What may, at first, seem like a far-fetched relationship, environmental education is related to, and equally as important as, the previously mentioned hands-on instructional methods and educational philosophies. For one, environmental education actually encompasses and emphasizes all of the following: active, relevant, and cooperative learning experiences. Moreover, it fosters the development of critical thinking skills, the ability to focus, and improved cognitive functioning (Project Learning Tree, 2010). According to the United States Environmental Protection Agency, environmental education can be defined as a method of increasing "public awareness and knowledge about environmental issues or problems. In doing so, it provides the public with the necessary skills to make informed decisions and take responsible action" (2015). However, in order to appropriately react to current issues impacting the planet, one must first learn about his or her immediate environment, a concept commonly referred to as place value. Place-conscious pedagogy has become a focal point of many environmental education programs; it pushes the boundaries of standard educational approaches by bringing to light the "pedagogical nature of human experience with places" (Gruenewald, 2003a, p. 619) and creating a deeper connection between self, community, and the local environment. In fact, scholars describe place-based education as involving the following:

> (a) it emerges from the particular attributes of place, (b) it is inherently multidisciplinary, (c) it is inherently experiential, (d) it is reflective of an educational philosophy that is broader than "learning to earn", and (e) it connects place with self and community (Gruenewald, 2003b, p.7).

In sum, it is evident that integrating aspects of place value into the proposed hands-on, environmentally conscious curriculum would be applicable to student learning, even within an interdisciplinary framework. Approaching education through this lens involves the integration of principles and methods from multiple academic disciplines in order to comprehensively analyze an issue being studied and to understand it more fully (Goldsmith, Hamilton, Hornsby, & Wells, 2012). When the focus is placed on real-world experiences, education becomes more authentic and multi-faceted as a result of the complexity of everyday issues, and an interdisciplinary model of learning allows students to view these real-life situations from all angles (Science Education Resource Center, 2010). Overall, this curriculum aims to develop a successful interdisciplinary framework for the general

education classroom while simultaneously providing the necessary supports for the growing population of ELLs in the United States by encouraging active engagement with content through meaningful, experiential, project-based incidences of learning within one's immediate environment.

Outline of Curriculum Goals

The following learning goals were developed in order to ensure all of the aforementioned educational philosophies are addressed and incorporated not only within the curriculum framework but also within the elementary school classroom. Similarly, the language goals are specifically outlined for English Language Learners (ELLs) that, within the context of a classroom that implements this curriculum, will acquire the appropriate cognitive academic language proficiency (CALP) and basic interpersonal communication skills (BICS) in the English language (Educational Resources Information Center, 1999).

Learning Goals:

Through the implementation of this curriculum, *all* students will be able to:

- Interact with the material, their classmates, and their teacher in a positive, meaningful way;
- Gain a better, more informed understanding of their place through meaningful, place-conscious learning experiences;
- Work cooperatively with other students in order to enhance their learning, communication skills, and ability to work with others in a group setting;
- Become increasingly aware of the environment, the current issues affecting it, and their role within it through developmentally appropriate learning experiences with nature;
- Create genuine, real-world products based on their interests, the given curriculum, and a project-based learning approach;
- Become active participants in their own learning through valued interactions with self, others, and the environment;
- Access prior knowledge in order to connect concepts to their own lives;
- Interact with and explore the various cultures represented in the class and within the surrounding community that influence their lives, their families, and their overall cultural competence;
- And explore standards and concepts through an interdisciplinary lens.

Language Goals for English Language Learners:

English Language Learners (ELLs) develop fluency and necessary language skills through frequent exposure to and practice with English. Through this particular curriculum, ELLs will be able to:

- Speak, read, and write using developmentally appropriate academic language and vocabulary, particularly in the environmental context across content areas;
- Develop basic interpersonal communication skills (BICS) through frequent interactions with their classmates, teacher, and meaningful lessons, projects with real-world applications;
- Refer to and access their first languages so that they may create connections and expand both their knowledge of their first language and English;
- And access prior knowledge in order to support growth in the target language (English) as it pertains to both their cognitive academic language proficiency (CALP) and BICS.

An Interactive Education for All Students

The Student Experience with Implications for English Language Learners

> I hear and I forget
> I see and I remember
> I do and I understand.
> (A Chinese proverb)

"Learning by doing" is a framework brimming with potential for structuring effective, interactive instruction that will promote sustainable knowledge acquisition. In fact, this curriculum has been designed to facilitate active engagement through a multitude of approaches including experiential, cooperative, and project-based learning experiences. In order to foster deeper connections with the material, connections must also be made to students' lives and real-world situations – a strategy that, likewise, supports an actively engaged classroom. Therefore, care must be given to emphasizing an education that values place – the local community, the environment, and students' own individual place in the world. For some students, specifically English Language Learners (ELLs), their personal place may refer to more than one community, perhaps encompassing their current location as well as another country or culture. As an educator, specific actions must be taken to ensure that all students' lives and experiences are validated and respected; thus, it is important that instruction be culturally relevant in order to enhance student learning and understanding of the world and each other.

As students become more aware of their surroundings through place-conscious pedagogy and observe how their actions affect the Earth, environmental education naturally reveals itself in the form of exploration and critical thinking about one's own surroundings, gradually becoming a focal point for learning. Moreover, encouraging engagement with the one's natural environment inherently supports child-like curiosity and wonder. Even though environmental education is often automatically associated with teaching about science, it can also act as a catalyst for math, social studies, and reading instruction, creating a solid foundation for an integrated, interdisciplinary curriculum framework.

Each of the aforementioned ideas forms the foundation for this curriculum; a detailed description of each can be found below:

Environmental Education

William B. Stapp, one of the early developers of the concept of environmental education, states that "environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution" (1969). Stapp's definition homes in on the innate relationships and exchanges between humankind, the culture through which these interactions take place, and both the natural and synthetic components of the environment. In other words, environmental education involves learning in, about, and for the environment (Lucas, 1972). This creates sensitivity toward, an understanding of, and a motivation to work to improve the natural world that benefits not only the learners, but also the planet as a whole as individuals are inspired to become environmental stewards and agents of change. According to the Environmental Education Council of Ohio, this educational framework is naturally interdisciplinary, promotes learning that is relevant to the needs and curiosities of the students in a way that motivates them, and encourages appropriate utilization of the outdoors as an active learning environment (2000).

Implications for ELLs: In many cases, ELLs come from countries and cultures other than the United States. Children with differing cultural backgrounds may exhibit unique relationships with and views of the natural environment (Marouli, 2002). These perspectives carry the potential to offer a greater depth to the learning experiences of both the students and the class as a whole. Additionally, environmental education provides a vehicle for these students to interact with the natural world through hands-on experiences, the involvement with which allows them to draw connections to their first language, prior knowledge, and past experiences.

Experiential Learning

An inherently participative approach to learning, this method interacts with the affective, social, and cognitive dimensions of the educational process (Association for Business Simulation and Experiential Learning, 1990). In other words, it involves learners emotionally, socially, and, of course, cognitively in a very active way. Beard and Wilson (2006) define experiential learning as "the sense-making process of active engagement between the inner world of the person and the outer world of the environment." It is the transformation of experiences into knowledge through an interaction between self and the environment, an exchange that naturally emphasizes a place-based approach to learning.

> **Implications for ELLs:** For nonnative speakers, direct interaction with the content is preferable over a word-heavy medium such as a textbook or lecture. Garcia says the following about the benefits of experiential learning for ELLs:
>> English language teachers should present content area instruction by a concrete approach that creates an exploratory and discovery-type learning environment in which students learn by doing – conducting experiments, observing and collecting data, etc. This approach empowers students to do their own thinking, value their contributions, and participate as active learners in the classroom (2003).
>
> Through meaningful learning experiences, ELLs are given the opportunity to witness, even participate in, real-life examples of the content, allowing them to create higher-level connections that transcend the depths of language.

Project-Based Learning

This area of education involves five specific areas of emphasis (Autodesk Foundation, 2000):
> **Centrality:** Projects are the foundation of the curriculum, not an afterthought
> **Driving question:** Students base their projects on what "drives," or motivates, them to approach the subject area
> **Constructive investigations:** Students are involved in practical explorations of their environment

Autonomy: Projects are student-driven and allow students the opportunity to become self-sufficient in their learning

Realism: Projects relate to real-life issues that are relevant to students' lives and experiences

These fundamental foci create the basis of the project-based learning (PBL) process that, when implemented in a setting where both environmental and place-conscious education are encouraged, allows students to connect their learning to real-word issues occurring outside of the classroom.

Implications for ELLs: Recent studies have concluded that PBL has a positive impact on the academic success of ELLs. As is evident from its five areas of emphasis, students are given autonomy with this approach and, thus, become responsible for their own learning while also taking advantage of the opportunity to explore content in new and inventive ways. When group collaboration is encouraged in addition to a PBL approach, knowledge is acquired more readily, especially for ELLs who benefit from the use of oral language (Campbell, 2012).

Cooperative Learning

When placed in a cooperative learning environment, students are given the opportunity to enhance both their academic and social growth by learning and interacting with their peers (Cohen, Brody, & Sapon-Shevin, 2004). According to Marr (1997), cooperative learning involves a heterogeneous group of students that both individually and collectively contribute to the completion a task, for which all members are responsible. This type of learning fosters interdependence, individual accountability, and collaboration (Johnson & Johnson, 1991).

Implications for ELLs: Stephen Krashen's acquisition-learning hypothesis states that the most effective process by which students learn a language is through natural communication with others. That is, communication during which the speaker focuses on conveying meaning instead of a perfected arrangement of words (Krashen, 1981). Cooperative learning requires that all

students interact with each other in order to accomplish an end goal; this process requires students to rely heavily on communication so that success can be achieved. Thus, ELLs are consistently exposed to the English language through these interactions and have numerous opportunities to engage in oral communication with their peers, enhancing both their academic and conversational language skills.

Place-Conscious Pedagogy

An interdisciplinary practice, place-based education takes into consideration not only the physical and natural environments but also the community that surrounds and supports the school, its staff, and its students. In the words of Gruenewald:

> As centers of experience, places *teach* us about how the world works and how our lives fit into the spaces we occupy. Further, places *make* us: As occupants of particular places with particular attributes, our identity and our possibilities are shaped (2003a).

Place is fundamentally pedagogical, having immense educational value because it is where experiential learning flourishes. Additionally, it links content to the dynamics of the place and connects self with community and the environment (Woodhouse & Knapp, 2000). Placed-based education has been noted for increasing academic achievement, improving student understanding of and attitude toward the natural world, developing and strengthening student-community relationships, and enhancing student understanding of one's responsibility as a citizen (Sobel, 2004).

> **Implications for ELLs:** Gruenewald (2003a) also notes the innate relationship between culture and place, a fundamental connection for many nonnative students from other countries. Cultures may experience the human-nature relationship differently from one another, some engaging in a deeper connection than others. Thus, it becomes essential for these students to feel connected to and a part of the place where they learn and live; without this context, learning becomes meaningless, and students, especially those from other cultures and linguistic backgrounds, can become increasingly isolated from their learning, their community, and the planet. When this relationship

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is fostered, however, ELLs become empowered, "developing a sense of ownership and belonging" (Westervelt, 2007).

Culturally Relevant Pedagogy

This philosophy of education maintains that there should be an active home-community and school relationship that fosters cultural understanding and inclusivity within the classroom (Brown-Jeffy & Cooper, 2011). Thus, students and families, particularly those from diverse backgrounds, are respected and empowered through academic success and maintaining cultural competency (Ladson-Billings, 1995). As a result, unique cultural experiences, values, and understandings are integrated, with sensitivity, into the learning environment (Brown-Jeffy & Cooper, 2011). Culturally relevant instruction promotes academic success, utilizes students' cultures as a vehicle for learning, and empowers students to critically analyze societal inequities (Ladson-Billings, 1995); this is especially important when a school serves students of differing ethnicities, languages, and cultural experiences.

Implications for ELLs: As a result of its focus on student cultures, languages, and unique experiences, the implementation of culturally relevant pedagogy (CRP) has increased the engagement and academic achievement of students from diverse backgrounds (Villegas, 2002). Students witness academic success when they can relate their learning to their own lives, and the incorporation of these children's cultures into the learning environment establishes a direct link between the curriculum and the learners (Lopez, 2011). In her article discussing culturally responsive teaching, Villegas makes the following statement:

> The knowledge children bring to school, derived from personal and cultural experiences, is central to their learning. To overlook this resource is to deny children access to the knowledge construction process (Villegas, 2002, p.25).

When students are viewed as individuals with unique sets of experiences, cultures, and interests, instruction can then reference these funds of

knowledge (Moll, Amanti, Neff, & Gonzalez, 1992), inspire real, relevant learning, and create an engaging and empowering educational setting.

Interdisciplinary/Integrated Instruction

An interdisciplinary approach uses the skills and knowledge acquired in all subject areas in order to enrich and bring together other areas of the curriculum into meaningful relationship. An article in the School Improvement Research Series regarding integrated curriculum outlines the following shared attributes of all definitions of an interdisciplinary framework: a blend of subjects, a focus on projects, relationships among topics, and thematic units as organizing features (Northwest Regional Educational Laboratory, 1994). Students that are instructed in an interdisciplinary fashion begin to acquire integrated knowledge that benefits them in numerous ways, such as greater depth and breadth of learning, quicker information retrieval, and increased positivity (Lipson, Valencia, Wixson, & Peters, 1993). This approach is ideal when the academic material is focused on the environment. According to the Environmental Education Council of Ohio, "the interdisciplinary nature of environmental topics and issues make it desirable, even necessary, to implement environmental teaching and learning through an integrated approach" (2000).

Implications for ELLs: Allowing nonnative English speaking students to work with the material and view their learning in an integrated way develops students' confidence in themselves as interdisciplinary learners, utilizing their strengths in one area to compensate for and improve the weaknesses in others (Rodriguez-Valls, 2012). Specifically, purposeful involvement with interdisciplinary themes that extend beyond simply reading from a textbook gives ELLs greater access to the information and promotes active construction of knowledge.

Grade Level Overviews

This curriculum utilizes the Virginia Standards of Learning, the WIDA standards for ELLs, and the national standards for science, social studies, mathematics and language arts* as a foundation for grade level frameworks, which follow the Piagetan stages of cognitive development and Vygotsky's sociocultural theory as references for the development of age-appropriate content and the progression of student learning. Thus, the unit summaries, envisioned below, pull from the multitude of educational philosophies on which this curriculum is based, various standards of learning, and the creative agency of the author.

*In light of recent events with No Child Left Behind legislation, the standards on which this curriculum focuses may become void within a few years. Appropriate adjustments may be required to ensure correct alignment with current standards.

    Grade 1: Foundations of Self and Place

        A Unit Summary: Exploring the Local Environment

            This unit sets the stage for student learning in a project-based, environmentally- and place-focused context through hands-on experiences with the local area and the self, including, but not limited to, field trips to local parks, the cultivation of a school or class garden, and projects centered on indigenous vegetation and wildlife, local environmental history, and other interdisciplinary topics. Throughout this unit, and for the duration of the first grade, students will be placed in an educational environment that cultivates a sense of self in relation to their immediate surroundings and, most importantly, the natural world. See **Appendix A** for a sample lesson from this unit.

    Grade 2: Creating Connections

        A Unit Summary: Evaluating an Individual's Impacts on the Environment

As is evident from its title, this unit focuses on the students and their individual effects on their surroundings. Building on the first grade themes of self and place, the second grade curriculum aims to create a more concrete bridge between the two through additional experiential learning opportunities and experiences with the natural environment, such as hands-on projects based on the responsibilities of a citizen, individual waste production, and other interdisciplinary concepts. See **Appendix B** for a sample lesson from this unit.

Grade 3: The Fundamentals of Communication and Community

A Unit Summary: Government, Community, and Individual Responsibility

Continuing to build on the themes of previous grade levels, third grade takes the idea of individual responsibility a step further into the realm of collective responsibility. Students engage in hands-on, integrated investigations in real-world contexts along side of their community of classmates in order to acquire a deeper understanding of the power of a communal voice and uniting for a common cause. See **Appendix C** for a sample lesson from this unit.

Grade 4: Focusing on Experience

A Unit Summary: Investigating Earth's Resources

In fourth grade, students are offered interactive, place-based experiences at a more frequent rate than students in earlier grades. This focus on experience offers students varied opportunities to learn about topics in greater depth and from differing perspectives, encouraging the development of critical thinking skills and preparing them to take on greater leadership roles within the context of their own learning. Lessons within this unit support students in their exploration of local watersheds, forests, vegetation, rocks and minerals, and energy sources. See **Appendix D** for a sample lesson from this unit.

Grade 5: Exploration

A Unit Summary: Local Wildlife

During fifth grade, student learning experiences are more intently focused on student interest and an increased level of leadership in their own learning. Depending on the area of study, which, in this unit, is local wildlife, students choose a supplementary subtopic on which to focus their studies, developing a related project either individually or as a group. Throughout the unit, lessons highlight major concepts, such as examples of local wildlife, adaptive physical and behavioral traits, and basic classification categories, which may serve as sources of information and inspiration for student project developments. See **Appendix E** for a sample lesson from this unit.

Methods of Assessment

Evaluating Nontraditional Learning

In order to assess students with limited English language proficiency, educators must use a culturally relevant approach that focuses both on the standards and the child as a unique individual. Since this framework caters specifically to English Language Learners (ELLs), assessing English language competency and development is essential (National Center for Research on Evaluation, Standards, and Student Testing, 2008). Additionally, the various educational models that are embodied within this curriculum need to be assessed in a comprehensive manner in order to provide accurate evaluative information concerning the strengths and weaknesses of the educational program and to factor in an aspect of accountability of both the teachers and learners involved in its implementation (Environmental Education Council of Ohio. 2000). The evidence provided by the assessments, ultimately, will reveal successes and failures of the educators, the educational philosophies, and the overall curriculum.

According to Cox-Peterson, Melber and Patchen, assessment can be defined as "the regular collection of information about students' strengths, challenges, and needs to inform teaching and learning" (2012). In the words of the Environmental Education Council of Ohio, "assessment answers the question, 'what are the learners learning?'" (2000). To create a culturally relevant approach to assessment, it must build "on what exists (student experiences and understanding) in pursuit of what can be" (Cox-Peterson, Melber, & Patchen, 2012). Each of the aforementioned definitions of assessment is significant and has contributed to the foundation of this framework's assessment methodology.

Not only does this curriculum focus on an alignment of student learning with state, national and WIDA standards, it also values an authentic educational experience that requires more than just an assessment of standards. Each student's growth, both as an individual and as a learner, is assessed in holistic ways, including student work portfolios, teacher-student interviews, and student reflections. Each of these methods of assessment contributes to the documentation of student achievements and advancements that reflects the whole child and engages the learner as an active participant in the assessment process. In fact, student involvement in the assessment process can

result in increased motivation, a sense of ownership of one's learning, and the creation of a meaningful educational experience (Ferlazzo & Sypnieski, 2012).

Portfolios

> The educational and instructional approaches of this curriculum are mainly project-based, which results in a plethora of student products for assessment. In order to instill a sense of authority of their own knowledge, students select work samples to incorporate into their portfolios while offering a reflection on why these projects effectively represent their progress and overall learning. In this way, students become active participants in their education and have the opportunity to critically analyze and demonstrate what they have learned and achieved (Cox-Peterson, Melber, & Patchen, 2012). Since portfolios contain work samples collected over an extended period of time (i.e. a semester or full academic year), they tend to become valuable documentations of student progress, offering "a rich picture of the learner's knowledge, skills, values, and accomplishments" that even the student herself can witness, assess, and develop (Environmental Education Council of Ohio, 2000). Examples of student work found in a portfolio include products from individual or group projects, video recordings of presentations or demonstrations, teacher observations, and drawings that represent the student's content knowledge. All in all, portfolios offer a comprehensive method of assessing student understanding that is readily accessible to ELLs.

Interviews

> Allowing students to provide an oral account of their work and newfound conceptual understanding creates an opportunity for both educators and learners to gain valuable insight into the learning process, especially when students assist in question preparation for the exchange. In order to maintain cultural relevance, interviews should reflect students' language and culture. Learners should also have the option to interview in pairs, which can offer support to ELLs during this linguistically focused interaction (Cox-Peterson, Melber, & Patchen, 2012).

Reflections

Either through the use of written journals, video logs, or oral explanations, reflections are powerful assessment tools for both the academic, linguistic and overall personal developments of ELL students. Reflections provide students with a method of monitoring their own learning, witnessing progress, and practicing developing language skills (Cox-Peterson, Melber, & Patchen, 2012). A learner's reflections can be fundamental to the identification of one's strengths and weaknesses, particularly when it comes to aspects of the English language (Trejos, 2008). Similarly, reflections offer teachers the opportunity to give students specific feedback, offer suggestions, or ask questions based on their thought processes and connections. This could also become a practice for the students to use with one another, providing useful feedback for each other's personal and academic growth.

Indicators of Success

For All Students
- o Demonstrates an understanding and mastery of the content and offers tangible evidence of one's comprehension of the standards, the academic language and concepts, and the relevant applications of the curriculum's main philosophies through related projects, presentations, reflections, and other assessable mediums.

For English Language Learners
- o Acquires, utilizes, and applies academic vocabulary and concepts within appropriate, real-world contexts (i.e. classroom conversations, presentations, project creation process) where the student's overall understanding of the terminology and concepts is evident through writing, reading, and speaking the language.

List of Instructional Resources

- ❖ General
  - o Sly, C. (2015). *Teaching strategies.* Retrieved from
    http://www.ecoliteracy.org/article/teaching-strategies
- ❖ Environmental Education
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- ❖ Culturally Relevant Pedagogy
    - o National Education Association. (2015). *Online resources for culturally responsive teachers.* Retrieved from http://www.nea.org/home/16723.htm
    - o TKCalifornia. (n.d.). *Culturally responsive and relevant teaching and learning.* Retrieved from http://www.tkcalifornia.org/teaching-tools/classroom-instructional-planning/culturally-responsive.html?referrer=https://www.google.com/
- ❖ Interdisciplinary/Integrated Instruction
    - o InTeGrate. (2015). *Effective strategies for interdisciplinary teaching.* Retrieved from http://serc.carleton.edu/integrate/teaching_materials/interdisciplinary_format.html
- ❖ Working with English Language Learners (ELLs)
    - o Northwest Regional Educational Laboratory. (2003). *Strategies and resources for mainstream teachers of English language learners.* Portland, OR: Reed, B., & Railsback, J. http://educationnorthwest.org/sites/default/files/ell.pdf
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Appendices:

Applications for the Classroom

Appendix A

SW = Students will	TW = Teacher will	SWBAT = Students will be able to...	HOTS = Higher Order Thinking Skills

Lesson Title: The Natural World, Reimagined   **Grade:** 1
        Unit: Exploring the Local Environment

Rationale:

At this age, students are in-between the intuitive preoperational and concrete operational stages of cognitive development according to Jean Piaget (1964). At the preoperational stage, children are focused on using symbols, particularly words, images, and gestures. Children at the concrete operational stage can relate these symbols to concrete objects, similar to the process involved in creating their garden maps in this lesson, which is a result of their developing awareness of events occurring outside of themselves. Throughout this lesson, students are encouraged to create an alternate representation of the physical garden they explore by using pieces of said garden as symbols in their scaled maps. Additionally, in accordance with Lev Vygotsky's sociocultural theory, students are engaged with one another during this lesson, involving the important processes of two other aspects of cognitive development – social interaction and scaffolding (Jaramillo, 1996). For instance, students work together in order to create their garden maps and describe them to the rest of the class. This can be particularly helpful to English Language Learners (ELLs), who may practice their language skills and receive scaffolded support through these interactions.

Moreover, this lesson demonstrates and upholds the core philosophies of this curriculum. Holding a lesson outside in a garden naturally adds in elements of place-based and experiential learning to this lesson. Learning about the environment while spending time within it offers a valuable learning experience, which, in this case, includes the creation of a product that utilizes the environment in a meaningful way. Students are encouraged to collaborate on this map-making project and present it to their classmates in unique and creative ways. Additionally, this lesson incorporates concepts from the areas of science, social studies, English, and visual arts, making it interdisciplinary.

Content Standard(s):

     WIDA

         In this and every lesson, each ELL should be met at the level at which they perform on the WIDA (World-class Instructional Design and Assessment) language development spectrum of English language proficiency (entering, emerging, developing, expanding, bridging, or reaching) in each of the four language domains: listening, speaking, reading and writing. "Can Do Descriptors" that correlate with each level should also be used as achievable expectations for these students. See http://www.waunakee.k12.wi.us/cms_files/resources/1-2%20CAN%20DOs.pdf for more information about "Can Do Descriptors" for first graders.

     Virginia Standards of Learning

         Science 1.8 *The student will investigate and understand that plants have life needs and functional parts and can be classified according to certain characteristics such as their* (b) *parts (seeds, roots, stems, leaves, blossoms, fruits).*

History and Social Science 1.5 *The student will construct a simple map of a familiar area, using basic map symbols in the map legend.*

English 1.1d *The student will continue to demonstrate growth in the use of oral language...Express ideas orally in complete sentences*; 1.3d *The student will adapt or change oral language to fit the situation...Ask and respond to questions in small-group settings.*

Visual Arts 1.11 *The student will create art from real and imaginary sources of inspiration.*

National Standards

National Council for the Social Studies Standard III: People, Places, & Environments
Social studies programs should include experiences that provide for the study of people, places, and environments, so that the learner can (a) *construct and use mental maps of locales, regions, and the world that demonstrate understanding of relative location, direction, size, and shape.*

Common Core State Standards for English Language Arts: Speaking and Listening
1.3 *Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood*; 1.5 *Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.*

Key Vocabulary: map, scale, names of plants growing in the garden, cardinal directions (north, east, south, west) **HOTS:** How can I represent the layout of a garden using only natural materials? How is my version of the garden similar to and different than the real-life garden? Why do maps exist? Why/how are they useful?	Visuals/Resources/Supplementary Materials: • Various examples of maps • Natural materials from the garden

Connections to Prior Knowledge/Building Background:
Students will brainstorm individual, and then a class, definition of a map through the use of context clues and past experiences. Then, students will explore the reasons and uses for maps while giving examples of their own experiences with maps. The teacher will then tell students that they will be creating maps without using paper and pencil; instead, they will be using natural materials that they find in the school garden.

Content Objective(s): SWBAT work collaboratively with a small group of their classmates in order to create a map of the	Meaningful Activities: Students will work alongside their classmates in order to create scaled maps of a garden they visit and explore together. Allowing	Review/Assessment: The teacher will take pictures of student garden maps, which can be added to student portfolios.

garden. SWBAT creatively engage with the natural environment in order to create their maps out of actual materials from the garden.	students to creatively use items from the garden to accomplish this makes this activity meaningful, hands-on, and interactive.	
Language Objective(s): SWBAT orally describe the relative locations of objects in the garden on the concrete maps that they create with their groups. SWBAT explain, either verbally, dramatically, or in writing, the purpose of their map and the parts of plants they used to create it.	**Meaningful Activities:** Students will be able to individually and collaboratively express their knowledge of maps and the garden through verbal explanations, dramatization, and/or written responses.	**Review/Assessment:** The teacher may take video of students describing their maps to each other and add these recordings to their portfolios. The teacher may also ask students to watch these videos later and reflect on the process and their explanations; in this way, the teacher can assess students for an understanding of maps and the parts of plants. If students choose to write out their explanations, these responses can be added to student portfolios. If a dramatization is chosen, the teacher can record it for future reflection and a portfolio piece.

Appendix B

Lesson Title: Tracking Trash   **Grade:** 2
     Unit: Evaluating an Individual's Impacts on the Environment

Rationale:
At this age, students are in the midst of the concrete operational stage of cognitive development according to Jean Piaget (1964). Children at this stage can relate symbols to concrete objects, similar to the process involved in the graphing activity within this lesson, which is a result of their developing awareness of events occurring outside of themselves. Throughout this lesson, students are encouraged to not only observe how much waste they and others produce but to also contemplate and envision the larger picture of waste production and reduction on a national, and even global, scale. Additionally, in accordance with Lev Vygotsky's sociocultural theory, students are engaged with one another during this lesson, involving the important processes of two other aspects of cognitive development – social interaction and scaffolding (Jaramillo, 1996). For instance, students must interview one another about their graphs. This can be particularly helpful to English Language Learners (ELLs), who may practice their language skills and receive scaffolded support through these interactions.

Moreover, this lesson demonstrates and upholds the core philosophies of this curriculum. By monitoring their school's waste production, students are engaged in a hands-on graphing project that provides them the opportunity to "learn by doing" in an experiential manner. The topic of waste and waste reduction are environmental in nature and place-specific, since the students are focusing their efforts within their own school. In order to complete the lesson, students must collaborate with one another in a cooperative and culturally appropriate manner. As is evident from the standards outlined below, this lesson is wholly interdisciplinary and executed in an integrated fashion.

Content Standard(s):
     WIDA
         In this and every lesson, each ELL should be met at the level at which they perform on the WIDA (World-class Instructional Design and Assessment) language development spectrum of English language proficiency (entering, emerging, developing, expanding, bridging, or reaching) in each of the four language domains: listening, speaking, reading and writing. "Can Do Descriptors" that correlate with each level should also be used as achievable expectations for these students. See http://www.waunakee.k12.wi.us/cms_files/resources/1-2%20CAN%20DOs.pdf for more information about "Can Do Descriptors" for second graders.

     Virginia Standards of Learning
         Mathematics 2.17 *Students will use data from experiments to construct pie graphs, pictographs, and bar graphs.*

         Science 2.1f *The student will conduct investigations in which pictures and bar graphs are constructed using numbered axes.*

English 2.2b *The student will continue to expand listening and speaking vocabularies...Clarify and explain words and ideas orally.*

History and Social Science 2.10c *The student will explain the responsibilities of a good citizen, with emphasis on describing actions that can improve the school and community.*

National Standards

Next Generation Science Standards K-2-ETS1-1 *Students who demonstrate understanding can ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.*

National Council for the Social Studies Standard III: People, Places, & Environments *Social studies programs should include experiences that provide for the study of people, places, and environments, so that the learner can* (k) *consider existing uses and propose and evaluate alternative uses of resources and land in home, school, community, the region, and beyond.*

Common Core State Standards for Mathematics: Measurement and Data 10 *Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.*

Common Core State Standards for English Language Arts: Writing 2.8 *Recall information from experiences or gather information from provided sources to answer a question.*

NCTE/IRA Standards for the English Language Arts 7 *Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience;* 10 *Students whose first language is not English make use of their first language to develop competency in the English language arts and to develop understanding of content across the curriculum.*

Key Vocabulary: Pie graph, pictograph, bar graph, data, experiment, waste, observation	Visuals/Resources/Supplementary Materials:
	• Clear visual examples of pie graphs, pictographs, and bar graphs
HOTS: How do my actions affect the environment, either positively or negatively? What if others created as much waste as I do? How would that impact/is that currently impacting the environment? How can I, as an individual, and my classmates decrease the amount of waste we as individuals along with	• Student field journals with scaffolded response sections for ELLs

the rest of the school population produce?	

Connections to Prior Knowledge/Building Background:
Students will reflect on the following:
- The number of objects they had thrown in the trash since they woke up and how the trash of each student in the class can accumulate
- How much trash their families throw out each day
- How often they recycle
- The consequences of everyone throwing out their trash every day

Content Objective(s):	Meaningful Activities:	Review/Assessment:
SWBAT use real, collected data to create a bar graph, pictograph, and pie graph and analyze the types and amounts of trash thrown away in the cafeteria during a typical school day. SWBAT develop a project that addresses the issue of waste production at the school and identifies a possible solution that aims to reduce the school's waste and/or increases instances of recycling.	Students are given the opportunity to visit the cafeteria and gather and record real data for their graphs. Students then develop a project to address the data they collected and analyzed and propose possible solutions to the problem of waste production at their school.	Students will answer questions (created by both the teacher and students), either through a written reflection or orally in an interview, pertaining to the process of gathering data and displaying it on a graph, interpreting the data, and evaluating the consequences of these findings.
Language Objective(s): SWBAT create two to three questions and use them to interview another student about his or her graphs, encouraging analysis and interpretation.	**Meaningful Activities:** Students will interact with their classmates in a meaningful context within which they are able to ask their own thoughtfully crafted questions.	**Review/Assessment:** The teacher will observe these interactions and assess student understanding based on their questions and responses. If necessary, the teacher may ask that students reflect on these interviews either verbally with the teacher or in written format; these reflections can be added to the student's portfolio or discussed in a future interview with the teacher.

Appendix C

Lesson Title: Exercising Civic Responsibilities   **Grade:** 3
          Unit: Government, Community, and Individual Responsibility

Rationale:

At this age, students are in the midst of the concrete operational stage of cognitive development according to Jean Piaget (1964). Children at this stage can relate symbols to concrete objects, which is a result of their developing awareness of events occurring outside of themselves. Throughout this lesson, students explore the ways in which local pollution affects the surrounding environment, how humans like themselves may play an important part in this, and how their local government can act as an avenue for change. Additionally, in accordance with Lev Vygotsky's sociocultural theory, students are engaged with one another during this lesson, involving the important processes of two other aspects of cognitive development – social interaction and scaffolding (Jaramillo, 1996). For instance, students may discuss their ideas and research with other members of the class, creating opportunities for debate and informed conversations. This can be particularly helpful to English Language Learners (ELLs), who may practice their language skills and receive scaffolded support through these interactions.

Moreover, this lesson demonstrates and upholds the core philosophies of this curriculum. Incorporating an experiential field trip to a local watershed or park allows for an interactive, meaningful, place-based experience with the environment that eventually translates into a collaborative effort to spark positive change within the community. Pulling from student experiences, particularly those students from other countries, creates a more culturally relevant context for this lesson. Integrating aspects of core subject areas such as English, science, and social studies, this lesson offers an interdisciplinary approach to the overall unit theme of government, community, and individual responsibility.

Content Standard(s):

WIDA

In this and every lesson, each ELL should be met at the level at which they perform on the WIDA (World-class Instructional Design and Assessment) language development spectrum of English language proficiency (entering, emerging, developing, expanding, bridging, or reaching) in each of the four language domains: listening, speaking, reading and writing. "Can Do Descriptors" that correlate with each level should also be used as achievable expectations for these students. See http://www.waunakee.k12.wi.us/cms_files/resources/3-5%20CAN%20DOs.pdf for more information about "Can Do Descriptors" for third graders.

Virginia Standards of Learning

History and Social Science 3.10c *The student will recognize the importance of government in the community, Virginia, and the United States of America by explaining that government protects the rights and property of individuals.*

English 3.9 *The student will write for a variety of purposes.*

Science 3.10b *The student will investigate and understand that natural events and human influences can affect the survival of species, including the effects of human activity on the quality of air, water, and habitat.*

National Standards

Next Generation Science Standards 5-ESS3-1 *Students who demonstrate understanding can obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.*

National Council for the Social Studies Standard III: People, Places, & Environments *Social studies programs should include experiences that provide for the study of people, places, and environments, so that the learner can* (h) *examine the interaction of human beings and their physical environment, the use of land, building of cities, and ecosystem changes in selected locales and regions.*

Common Core State Standards for English Language Arts: Writing 3.1 *Write opinion pieces on topics or texts, supporting a point of view with reasons*; 3.7 *Conduct short research projects that build knowledge about a topic.*

NCTE/IRA Standards for the English Language Arts 12 *Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).*

Key Vocabulary: pollution, environmental hazard, citizenship, responsibility **HOTS:** How has human interaction with the environment (or otherwise) changed the natural landscape? Have these changes been positive or negative? How can you use your rights as a citizen to improve the local environment? How might a collective voice be received differently than the voice of a single individual? How can the government play a role in improving the local environment?	**Visuals/Resources/Supplementary Materials:** • Field trip to a local watershed or park • Supplemental images, videos, newspaper articles, etc.

Connections to Prior Knowledge/Building Background:
The teacher should pose the following questions to the students: What is pollution? What types of pollution are there? What might be affected by pollution? Have you seen examples of pollution in your own lives? Is pollution prevalent in other countries (i.e. the home countries of some of the students)? Is pollution good for the environment? Why or why not?

In addition, allowing students to explore an example of how pollution has affected a local area (i.e.

a nearby creek, watershed, or park) offers them a first-hand experience with this issue and an opportunity to connect it with their own experiences.

Content Objective(s):	Meaningful Activities:	Review/Assessment:
SWBAT investigate the ways in which human interaction with the natural world has impacted water quality and local habitats. SWBAT conduct general research about the area the class visited and the types of pollution they observed.	Students will take a field trip to a local creek, watershed, or park and explore ways in which humans have interacted with the environment in both positive and negative ways, paying particular attention to water quality and animal habitats. Throughout their research, students may come across videos, stories, or images that may increase their interest. These items may then be shared with the rest of the class, if the student so chooses.	The teacher will have students reflect, either verbally or in writing, on their experiences during the field trip. These reflections may be discussed in an interview with the teacher or simply placed in the students' portfolios along with their final copies of their letters.
Language Objective(s): SWBAT write a letter to a local representative or environmental agency advocating for a solution to the current pollution issues they witnessed during the field trip to a local watershed or park. SWBAT read articles from multiple sources (e.g. newspaper, books, online) that will give them insight into the issue of local pollution and possible solutions.	**Meaningful Activities:** Students will be able to express their concerns for the local environment in a formal manner and experience the process of voicing their own thoughts in order to help spark change. Students may discuss their ideas with other members of the class in order to check their comprehension of their topics and their persuasive writing.	**Review/Assessment:** The teacher will either have a checklist or rubric for the letter; this will ensure that all students follow the correct letter format, comprehensively address the issue and provide a viable solution, and use at least two reliable sources. Checklists/rubrics can be added to student portfolios along with the students' letters. The teacher will also conduct interviews with students in order to more fully gage their understanding of the topic.

SW = Students will	**TW** = Teacher will	**SWBAT** = Students will be able to...	**HOTS** = Higher Order Thinking Skills

Lesson Title: Soil   **Grade:** 4
       Unit: Investigating Earth's Resources

Rationale:

At this age, students are in the midst of the concrete operational stage of cognitive development according to Jean Piaget (1964). Children at this stage can relate symbols to concrete objects, which is a result of their developing awareness of events occurring outside of themselves. Throughout this lesson, students are encouraged to not only observe the soil but to also contemplate its larger impacts on their community and the world as a whole. Additionally, in accordance with Lev Vygotsky's sociocultural theory, students are engaged with one another during this lesson, involving the important processes of two other aspects of cognitive development – social interaction and scaffolding (Jaramillo, 1996). For example, students will question one another about their soil research and project foci, encouraging a deeper exploration of the topic and informative conversations between students. This can be particularly helpful to English Language Learners (ELLs), who may practice their language skills and receive scaffolded support through these interactions.

Moreover, this lesson demonstrates and upholds the core philosophies of this curriculum. Students will have a first-hand, intimate experience with the earth and their local environment by collecting soil samples and closely inspecting the dirt that makes up the ground beneath their feet. This activity incorporates environmental, place-based, and experiential learning into the lesson. Based on their interests, students will conduct research and create a project based on their findings about soil and share it with the class. Additionally, in accordance with the qualities of cooperative learning, students are asked to interview each other about their research and projects and offer each other feedback prior to student presentations. Furthermore, opening the lesson with student and teacher examples of stories and folklore pertaining to soil/the Earth creates an opportunity to make this lesson culturally relevant. As is evident from the standards listed below, this lesson provides an integrated learning experience that incorporates a variety of subject areas including science, mathematics, English, and social studies.

Content Standard(s):
       WIDA
              In this and every lesson, each ELL should be met at the level at which they perform on the WIDA (World-class Instructional Design and Assessment) language development spectrum of English language proficiency (entering, emerging, developing, expanding, bridging, or reaching) in each of the four language domains: listening, speaking, reading and writing. "Can Do Descriptors" that correlate with each level should also be used as achievable expectations for these students. See http://www.waunakee.k12.wi.us/cms_files/resources/3-5%20CAN%20DOs.pdf for more information about "Can Do Descriptors" for fourth graders.

       Virginia Standards of Learning

Science 4.9d *The student will investigate and understand important Virginia natural resources, including forests, soil, and land.*

Mathematics 4.3 *The student will* (a) *read, write, represent, and identify decimals expressed through thousandths;* (c) *compare and order decimals; and* (d) *given a model, write the decimal and fraction equivalents.*

English 4.2 *The student will make and listen to oral presentations and reports*; 4.6 *The student will read and demonstrate comprehension of nonfiction texts*; 4.9 *The student will demonstrate comprehension of information resources to research a topic.*

History and Social Science VS.1 *The student will demonstrate skills for historical and geographical analysis and responsible citizenship, including the ability to* (d) *draw conclusions and make generalizations and* (e) *make connections between past and present.*

National Standards

National Council for the Social Studies Standard III: People, Places, & Environments *Social studies programs should include experiences that provide for the study of people, places, and environments, so that the learner can* (i) *explore ways that the earth's physical features have changed over time in the local region and beyond and how these changes may be connected to one another.*

Standard I: Culture *Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can* (c) *describe ways in which language, stories, folktales, music, and artistic creations serve as expressions of culture and influence behavior of people living in a particular culture.*

Common Core State Standards for English Language Arts: Writing 4.7 *Conduct short research projects that build knowledge through investigation of different aspects of a* topic; 4.9 *Draw evidence from literary or informational texts to support analysis, reflection, and research.*

NCTE/IRA Standards for the English Language Arts 7 *Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g. print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.*

Key Vocabulary: resource, soil, raw material, mineral, nutrient, humus, clay, silt, sand, fraction **HOTS:** How and why is soil a valuable natural resource? What would the Earth be like without soil? Has soil changed throughout time? If so, how?	**Visuals/Resources/Supplementary Materials:** • Collection of soil samples • Images

Connections to Prior Knowledge/Building Background:

Students will be taken outside to explore the different types of soil that surround their school.*
Students will collect soil samples that will be used as a basis for discussion and research. The
teacher may ask students the following questions: Where have you seen soil before? In your yard?
In a garden? In the woods? What can you find in soil? Why do you think soil is so important? How
does your family or culture view soil? Do you know any folktales or stories about soil? Allow
students to bring in and share traditional stories about soil or the Earth.

Then, the teacher will read aloud *SOIL* by Christin Ditchfield while scaffolding note-taking
instruction and encouraging student questions and discussion.

*If the school is located in the city, a field trip to a local park would also work for this part of the
lesson.

Content Objective(s):	Meaningful Activities:	Review/Assessment:
SWBAT identify the components of soil and its importance as a natural resource. SWBAT conduct supplemental research about soil and share their findings with a partner. SWBAT identify what fraction of the soil samples are sand, silt, and clay, convert these fractions into decimals, and compare and contrast the decimal amounts of the samples.	Students will engage in observation and investigation as they interact with and research the soil samples they have gathered from outside. During this activity, students will calculate the estimated fraction of sand, silt, and clay found in the soil samples, convert them to decimals, and compare their results with other samples. Students will participate in a pair-share experience as they discuss the focus of their research and their findings. The teacher will have students create questions to ask one another in order to encourage students to think more deeply about their chosen focus.	Calculations made with soil samples may be added to student portfolios. Teachers may also conduct interviews with students to further gage their understanding of the mathematical concepts of fractions and decimals.
Language Objective(s):	Meaningful Activities:	Review/Assessment:
SWBAT create a project based on their soil research and present it to the class. SWBAT write at least three ideas about soil that they found most	Students are given the opportunity to choose a specific topic focus and medium through which they may present their findings to the class. This could include artwork, a report, a dramatization, a video, etc.	Student project presentations can be recorded and added to their portfolios along with student reflections, either verbal or written, on the research and project creation processes. The teacher may create a rubric for the project and presentation, which may also be added to student portfolios. The student's

important and reflect on them.		classmates may also provide a peer-assessment of his/her project presentation. Student reflections on important aspects of soil may be added to the student's portfolio and reviewed by the teacher in order to assess comprehension.

Appendix E

SW = Students will	**TW** = Teacher will	**SWBAT** = Students will be able to...	**HOTS** = Higher Order Thinking Skills

Lesson Title: Sound Vibrations in the Wild   **Grade:** 5
      Unit: Local Wildlife

Rationale:
At this age, students are entering the formal operations stage of cognitive development according to Jean Piaget (1964). Children at this stage can reason in abstract ways and consider multiple possibilities for a solution to an issue. During this lesson, for instance, students must consider a variety of approaches in order to decide on one that would appropriately and comprehensively demonstrate their knowledge of sound waves. Additionally, in accordance with Lev Vygotsky's sociocultural theory, students are engaged with one another during this lesson, involving the important processes of two other aspects of cognitive development – social interaction and scaffolding (Jaramillo, 1996). This can be particularly helpful to English Language Learners (ELLs), who may practice their language skills and receive scaffolded support through these interactions.

Moreover, this lesson demonstrates and upholds the core philosophies of this curriculum. Students are acquiring knowledge about sound vibrations through hands-on experiences within their local environment and with real instruments and animal sounds. Some of these sound samples are representative of a variety of cultures, including those of some of the students, which makes this lesson culturally relevant. Additionally, they work cooperatively in small groups in order to create a project demonstrating their understanding of the interdisciplinary topic, which includes subjects such as science, English, and social studies.

Content Standard(s):
    WIDA
        In this and every lesson, each ELL should be met at the level at which they perform on the WIDA (World-class Instructional Design and Assessment) language development spectrum of English language proficiency (entering, emerging, developing, expanding, bridging, or reaching) in each of the four language domains: listening, speaking, reading and writing. "Can Do Descriptors" that correlate with each level should also be used as achievable expectations for these students. See http://www.waunakee.k12.wi.us/cms_files/resources/3-5%20CAN%20DOs.pdf for more information about "Can Do Descriptors" for fifth graders.

    Virginia Standards of Learning
        Science 5.2d *The student will investigate and understand how sound is created and transmitted, and how it is used, including uses and applications of sound waves.*

        English 5.1e *The student will listen, draw conclusions, and share responses in subject-related group learning activities and demonstrate the ability to collaborate with diverse teams.*

    National Standards

National Council for the Social Studies Standard I: Culture *Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can* (c) *describe ways in which language, stories, folktales, music, and artistic creations serve as expressions of culture and influence behavior of people living in a particular culture.*

NCTE/IRA Standards for the English Language Arts 12 *Students use spoken, written, and visual language to accomplish their own purposes (e.g. for learning, enjoyment, persuasion, and the exchange of information).*

Key Vocabulary: waves, frequency, wavelength, vibration, amplitude, pitch **HOTS:** How are the animal sound vibrations similar to and different than those made by instruments?	**Visuals/Resources/Supplementary Materials:** • Various musical instruments from various cultures and classifications (percussion, stringed, wind, and electronic) • Animal sound sample recordings with accompanying images

Connections to Prior Knowledge/Building Background:
At first, students will be taken to an outdoor habitat, a local park, the school garden, etc. The teacher will ask students to listen for different animal sounds within the environment. What sets them apart from one another?

The teacher will then have instruments and samples of animal sounds both from local sources and from various cultures around the world, including those cultures represented within the class, and hold a discussion about the similarities and differences between them. Why do some sound similar/different? What do you believe makes them similar/different? How is sound made? What are the aspects of sound that can change?

Content Objective(s):	Meaningful Activities:	Review/Assessment:
SWBAT compare and contrast the frequency and amplitude of wavelengths created by both animal and instrumental sound vibrations. SWBAT demonstrate their knowledge of both animal and instrumental sound vibrations through a group project of their choice.	Students are given the opportunity to work directly with real instruments from various cultures around the world in order to measure frequency and amplitude. In addition, they will have samplings of diverse animal sounds to analyze as well. With these resources at hand, students will create a project demonstrating the knowledge they gain from these experiences with a small group of their classmates.	The teacher will conduct interviews with students in order to more fully gage their understanding of the topic.

Language Objective(s):	Meaningful Activities:	Review/Assessment:
SWBAT communicate and collaborate with a small group in order to complete a project together. SWBAT present their projects to the rest of the class.	Students will be given the opportunity to work together in small groups in order to create a project based on the sound vibrations of both the instruments and animal samples, paying close attention to frequency, amplitude, and wavelengths. Once their projects are finished, students will present them to the rest of the class.	Student project presentations can be recorded and added to their portfolios along with student reflections, either verbal or written, on the research and project creation processes. The teacher may create a rubric for the project and presentation, which may also be added to student portfolios. The student's classmates may also provide a peer-assessment of his/her project presentation.

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