

**TEACHING THE URBAN STUDENT AS A WHOLE:
UTILIZING UNIVERSAL SKILLS IN SCIENCE AND SOCIAL STUDIES
INTERDISCIPLINARY CURRICULA
BY CHRISTIANNA BERG**

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Curriculum Vitae

Christianna Berg

Credentials

Masters in Educational Program Design, focus on Inclusion

Bachelors in Elementary Education, Fine Art Minor

K-6 Elementary Education Certification

7-9 Mid-Level Science Education Certification

7-9 Mid-Level Mathematics Education Certification

Education

2016- 2017

University of the Arts

Philadelphia, PA

*Masters in Educational Program Design, Focus on Inclusion

2006-2009

West Chester University

West Chester, PA

*Bachelors in Elementary Education, Minor in Studio Art

Employment History

***2016-Present**

Mariana Bracetti Academy Charter School

Philadelphia, PA

-9th Grade Environmental Science, High School Math Summer School,

5th Grade Science and Social Studies (2017-2018)

- Filmed a lesson using reading skills in science for use with professional development with a Catapult Learning.
- Wrote the 5th grade science and social studies curriculum for the 2017-2018 school year.

***2014-2016**

One Bright Ray Community High School

Philadelphia, PA

-11th-12th Grade Geometry, Biology, Chemistry, Health and Skills

- Ran professional development sessions on organizing classrooms and procedures to ensure smooth lessons.

***2013-2014**

Universal Institute Charter School

Philadelphia, PA

-7th Grade Science, Writing, and RTI.

-Science Teacher Leader and 7th Grade Team Leader

- Wrote the K-8 Science Curriculum, focusing on the K-5th and 7th grade scope and sequence.
- Ran professional development sessions on science teaching techniques and implementing new curriculum.

Introduction

The purpose for this project is to utilize interdisciplinary curricula to emphasize transferable skills across the four main subject areas: reading, mathematics, science, and social studies. This project aims to provide a background for the creation of an interdisciplinary curricula that can be adjusted to current instructional programs being used in any classroom. The proposed curriculum is designed for fifth grade in a Title I school in Philadelphia. Title I schools are high-poverty schools that receive government funding to help reach proficiency on test scores, in an attempt to balance educational opportunity (Stedman, 2010). The students served by this curriculum are behind in all subject areas and will need support in reading and math, as well as science and social studies. More specifically, according to the third grade Pennsylvania System of School Assessment (PSSA) data from the 2015-2016 school year, these students scored 69.8% below proficiency in English Language Arts (ELA), in comparison to statewide 45.6% below proficiency. On the third grade Math PSSA, these students scored 75.4% below proficiency in comparison to statewide 39% below proficiency in math. Please refer to Appendix A for more information regarding PSSA data from the 2015-2016 school year. The students will be rotating through three classrooms throughout the day, seeing a language arts teacher, mathematics teacher, and a science/social studies teacher. Due to the student's academic needs, the proposed curriculum will focus on integrating content areas and skills across curricula for the science and social studies classroom. Ideally, with this curriculum, students will be able to strengthen their reading and math skills without losing the crucial learning benefits of transferable skills in the science and social studies curricula.

Problem Statement

The emphasis on reading and mathematics test scores brought on in the wake of No Child Left Behind (NCLB) in 2002 have pushed science and social studies to the background in many elementary schools, leaving children without the critical thinking skills and content knowledge these subjects develop. With the pressures of standardized testing linked to federal funding, the low income schools most dependent on that funding cram their days with reading and math in the elementary classes (Olson, 2006; Stedman, 2010; Winstead, 2011). Many states, like Pennsylvania, give standardized tests in mathematics and reading each year from grade 3 to 8 (Pennsylvania Department of Education, 2016). The Pennsylvania Department of Education (PDE) website neglects to even mention the Science PSSA on their own website description. Science is tested in the PSSAs for fourth and eighth grade only. There are no elementary standardized tests for social studies at all in Pennsylvania (Pennsylvania Department of Education, 2016). According to the World History Center, a project of University of Pittsburgh, only South Carolina and Delaware have reported a standardized test for social studies in elementary grades (World History Center, 2010). Since science and social studies are largely absent in high-stakes testing, they often get put on the back burner in elementary curriculum, leaving children without both the skills and content knowledge learned in these courses (Pederson, 2007).

The gap in reading and mathematic abilities for high-poverty schools causes stress for passing the standardized tests, which are often linked to federal funding. Standardized tests are used as a means of a performance comparison to determine grades, teacher job security, and school funding (Ladd, 2009; Winstead, 2011). According to Winstead (2011), in NCLB, low

performing schools end up with lower funding for resources, putting them at a disadvantage in their attempt for students to reach proficiency.

“High-performing schools or schools that meet appropriate and significant gains yearly on standardized tests, as noted in gains achieved in overall student and subgroup scores, are awarded additional funding by the federal government. Those schools that continue to underperform are labeled for school improvement and can eventually be closed if they do not make specific gains in scores from year to year” (Winstead, 2011, p.221).

In 2014, over half of the nation fell below proficiency in reading, and there was a clear gap in between income levels as well, showing a 26% increase in the number of fourth graders in high-poverty schools performing below proficiency, in comparison to low-poverty schools (Annie E. Casey Foundation, 2014). Reaching proficiency is a constant uphill battle for students who come to school already behind (Annie E. Casey Foundation, 2014). Despite how hard a student may have worked all year, a student can remain behind for the rest of their educational career (Silvernail, et al, 2014). If the student has an independent reading level of first grade equivalent starting in fourth grade, they would need to make four years’ growth in reading by Spring to make proficiency. By the time that student reached summer break, they would be expected to reach 5th grade reading level, adding yet another year’s growth to their workload. This Sisyphean task leads to schools cutting back on social studies and science to make time for remedial reading and mathematics, hoping students can reach proficiency (Olson, 2006; Winstead, 2011; Fitchett, Heafner & VanFossen, 2014). Under NCLB, schools were required to make Annual Yearly Progress (AYP) to at least show growth in their goal towards proficiency

(Winstead, 2011). Science and social studies content could be used to help support reading and math skills, rather than being bumped out of the curriculum time.

Noting flaws in NCLB, the laws in education have shifted to the Every Student Succeeds Act (ESSA) which is set to go into effect in the 2017-2018 school year. States are currently submitting their plans for the next school year on how they will demonstrate growth and accountability aligning to the new ESSA. Under ESSA, elementary schools must submit information for rating the school including an academic achievement indicator, a second academic indicator, English language proficiency, and an indicator of school quality or student success (Klein, 2017). The academic achievement indicator is the reading and math test scores through standardized tests, while the second academic indicator can be reading and math growth, closing academic gaps, or science and social studies test scores (Klein, 2017). The science and social studies scores can also be included as a part of school quality and student success (Klein, 2017). This change in accountability may help address the lack of support science and social studies received in the wake of NCLB. However, this would require more standardized testing for Pennsylvania, which only tests science twice and never tests social studies (Pennsylvania Department of Education, 2016). More standardized testing for students who already spending 18+ hours on standardized testing yearly is not necessarily the route education should move toward (Strauss, 2015). However, the ability to include science and social studies, though optional, provides a silver lining for science and social studies teachers and supporters (Klein, 2017).

With the introduction of Common Core State Standards (CCSS) launched in 2009, a shift was made in the Language Arts standards toward inclusion of informational text, rather than

focusing on literature alone. The CCSS are intended to prepare students for access to information in college and career settings, practicing comprehension and communication of informational text, including science and social studies (Common Core State Standards Initiative, 2017).

“With the ELA standards, English teachers will still teach their students literature as well as literary nonfiction. However, because college and career readiness overwhelmingly focuses on complex texts outside of literature, these standards also ensure students are being prepared to read, write, and research across the curriculum, including in history and science. These goals can be achieved by ensuring that teachers in other disciplines are also focusing on reading and writing to build knowledge within their subject areas.”
(Common Core State Standards Initiative, 2017, para 18).

In the newer curriculum sets tied to Common Core, science and social studies are starting to make a dent in the reading block through nonfiction stories and expository text in comparison to older curricula (Moss & Newton, 2002). As students are exposed to more nonfiction stories and informational text in their language arts classes, we may see an increase in their content knowledge of science and social studies (Leal, 1993). However, the increase in exposure to random topics does not replace the skills learned in science and social studies courses. Science and social studies help practice and apply meaningful skills that help students understand the world around them through asking questions, testing theories, analyzing ideas, and drawing conclusions about what they uncover (Husni & Rouadi, 2016).

Significance

Science and social studies teach meaningful skills and provide context for math and reading, so they are crucial elements that deserve curricular space (Duncan, 2011; Husni &

Rouadi, 2016). With the achievement gap seen between lower income and higher income students, a greater divide is established as students lose out on the application of skills in science and social studies (Winstead, 2011). Science and social studies teach our students valuable skills that they will need as adults. In science, students learn to ask questions, investigate, think critically, and problem solve. According to Bill Nye (2016, para 1), "Everybody in the space program, everybody who's a doctor, got interested in science when he or she was seven or eight years old... not when they were 16 or 18. That's where you spend your money: science education in elementary levels." The most important thing that science education can do is teach our children to think through problems (Grant & Fisher, 2014). Instruction should be designed so students can practice the development of questions and design a process to answer their question through inquiry (Grant & Fisher, 2014). Science can teach students to think, question, analyze, and draw conclusions to help them make informed decisions about their world. Although the 21st Century is already underway, schools are finally adopting '21st Century skills' to better prepare students for their future careers. According to Thoughtful Learning (2017), students need more problem solving and critical thinking practice in order to be prepare for the future workforce.

"To hold information-age jobs, though, students also need to think deeply about issues, solve problems creatively, work in teams, communicate clearly in many media, learn ever-changing technologies, and deal with a flood of information. The rapid changes in our world require students to be flexible, to take the initiative and lead when necessary, and to produce something new and useful," (Thoughtful Learning, 2017, para 4).

Schools are now trying to integrate these 21st Century Skills into the classroom. Science instruction is a great area for teachers to help students practice these integral skills, easily aiming toward problem solving, communication, teamwork, and technology.

In social studies, students learn about the past, various cultures, government, and current history in the making. According to the National Council for the Social Studies (1988, para 16), “Basic skills of reading, writing, and computing are necessary but not sufficient to participate or even survive in a world demanding independent and cooperative problem solving to address complex social, economic, ethical, and personal concerns.” Teachers need to use science and social studies to help students develop skills needed in everyday decision making (Yali & Hoge, 2005). With social media, information is shared faster than ever. People aren’t stopping to check the validity of what we read before clicking “share.” Educators need to teach students about the successes and mistakes of the past and how systems like the government and economics work so they can make informed decisions as an active member of society. Current and future generations need to know how to compare sources and check information given online and in interviews. According to Mendez Hinojosa (2015), students need to learn to critically assimilate the information they are given.

“The risk of substituting knowledge for the information. Simplifying messages, after ensuring the speed, economy and intelligible transmissions, can lead to the trivialization of the events and the shallowness of the interactions. It’s not enough knowing how to access information; it requires a cognitive work that allows its transformation into real knowledge and the development of powerful cognitive resources to turn reflection,

critical assimilation and creation into new information,” (Mendez Hinojosa, 2015, p. 185).

Propaganda thrives when the civilians are uninformed and blindly follow any source given (Snow, 2014). Students need to learn how to find information, but also how to decide the relevance and credibility of sources they find. Science and social studies can enable students to think critically and ask questions about the world around them.

In order to teach a student to the best of our abilities, schools need to teach the child as a whole. The education system has broken content into silos that do not communicate or transfer skills from one to another (Aulls, 2003). As high stakes assessments have given priority to the math and reading silos, science and social studies have less time in the curriculum and important skills are being left out. Valuable skills are gathered and practiced across all of the content areas taught in school, so why not support and blend them as much as possible? Schools have already made steps away from test-only and lecture-only classrooms by including visual learning in the classroom (Raiyn, 2016). The next step in reaching new learners is to utilize multidisciplinary lessons to help foster connections the content areas have in the real world. Students do not go into the world and have an hour of math followed by a block of reading. Students will need to apply various skills and subject-based concepts at the same time. A simple trip to the store will include science and geography while driving a car, reading signs and labels, and math while paying for the purchased goods. While there have been some existing problems, the proposed curriculum attempts to repair these problems.

Guiding Questions

As I began to design the proposed curriculum, specific questions began to arise in the research process. The purpose of the curriculum is to use the science and social studies curriculum as a means to support problem solving, reading, and writing skills.

1. What skills are typically taught in science and social studies that would be beneficial in an interdisciplinary approach to learning?
2. How can science and social studies support reading and math skills?
3. How has high-stakes testing impacted science and social studies curricula in high needs urban schools?

Using these questions as a focus, an interdisciplinary curricula can be written to help support integral mathematic and reading skills without sacrificing curricula time for science and social studies.

In order to guide the process of creating the curriculum, I will explore several areas. First, I will explore the skills in content areas in the literature review. After I describe the skills of the content areas, I will explain the benefits of interdisciplinary curricula. More specifically, I will discuss the vital skills of problem solving, reading, and writing and how they can be emphasised in the interdisciplinary curricula. Lastly, I will discuss current ready-made curricula for elementary school.

Literature Review

This literature review focuses on the benefits of practicing universal skills in science and social studies courses, particularly in elementary curricula. This literature review also seeks to identify the benefits of interdisciplinary curricula on teaching the whole child, while also

supporting state requirements. Studies currently exist on the impacts of science or social studies, but not typically a combination (Leal, 1993; Aulls, 2003; MacPhee & Whitecotton, 2011; Norton-Meier, Hand & Ardasheva, 2013). The literature review will focus on problem solving skills, reading and writing skills, benefits of interdisciplinary curricula, and available curricula. Science and social studies are being left out of the elementary curricula, yet they are vital content areas that teach and practice problem solving and critical thinking skills.

The problem addressed in this paper is that science and social studies are often given little time in the classroom due to standardized testing focusing on reading and mathematics (Olson, 2006; Pederson, 2007; Stedman, 2010; Winstead, 2011). When schools are underperforming in standardized testing, time dedicated to science, social studies, and arts typically dwindles in order to provide more time for remedial math and reading support (Winstead, 2011). This literature review will provide support for keeping science and social studies in elementary classrooms. In the literature review, I will conclude by discussing interdisciplinary curricula as an alternative solution to remedial math and reading only practice.

Content Areas

Often when students have access to science and social studies, they have difficulty integrating knowledge between subjects, unless it is explicitly taught (Al Husni & El Rouadi, 2016). Teachers that do not collaborate on strategies used in their classrooms can add to the divide in strategy uses across content areas (Mertens, 2013). Pennsylvania certifications have changed in 2013 from K-6 Elementary Certification to K-3 and 4-8 content-specific certifications (The Pennsylvania State University, 2007; Pennsylvania Department of Education, 2007). Since the specialized teacher certification for grades 4-8 are subject specific, these teachers may see

themselves as subject experts and may feel unable or unwilling to work across disciplines. Many times, content grouped teachers meet for curriculum planning and skill development. Grade-level grouped teachers meet to talk about schedules, behaviors, and student concerns. Rarely do teachers meet with their grade groups or other content teams to discuss interdisciplinary skills and common procedures or language to use in their classroom (Mertens, 2013). This is a lost opportunity to meet the students' needs across classrooms. Utilizing common planning and common skill practice could help the students with transferring skills from one course to another (Aulls, 2003; Auman, 2015). Though mathematics and reading are focal points in the elementary curriculum, science and social studies are essential content areas that can be used to practice and apply common skills.

Science in elementary school. Studying science in elementary classrooms helps students develop skills in problem solving, reading, and writing about content. According to Young, Feille, and Young (2017, p.1), University of North Texas, "[...] science is a critical component of a student's educational experience, and essential for understanding and addressing many of society's most pressing current and future challenges." Students need to be prepared to solve problems for the jobs of the future that have not yet been invented (Noel & Liub, 2017). Students in elementary school need to feel investment and interest in science in order to help build their confidence in science in later years (Silvernail, Sloan, Paul, Johnson, Stump & University of Southern Maine, 2014). According to Grant and Fisher (2014) students should practice science to help become better problem solvers and future scientists and engineers.

"Utilizing students' natural inquisitiveness, let's consider instruction designed to teach students to use the language and practices of scientists and engineers. These interrelated

practices ensure that students' questions will grow in sophistication and in the understanding of how to use questions to identify possible problems for investigation. Then, students conduct an investigation that yields data or findings that through analysis catapult them into solutions, new questions, and the next problem of study," (Grant & Fisher, 2014, p.19).

Multiple studies indicate that science education has an effect on student performance and success in future Science, Technology, Engineering, and Mathematics (STEM) careers (Noel & Liub, 2017; Young, Feille & Young, 2017; Atwater, Lance, Woodard, Johnson, 2013).

Several studies discuss the benefits of design thinking and the scientific heuristic writing (Noel & Liub, 2017; Greenbowe, Hand & Rudd, 2007). Design thinking and similar strategies help students with problem solving solutions, as well as communication of information (Noel & Liub, 2017; Greenbowe, Hand & Rudd, 2007). Some reports indicate the benefits of strategies to teach elementary science through reading and writing (Aulls, 2013; Fisher & Frey, 2014; Norton-Meier, Hand & Ardasheva, 2013). Perhaps with ESSA going into effect, future studies will be conducted on the benefits of science in elementary classrooms.

Social studies in elementary school. As reported by the National Council for Social Studies (2017), social studies are often left out of elementary classrooms to make time for extra reading and mathematics practice.

"The marginalization of social studies education at the elementary level has been documented repeatedly. According to a report by the Center on Education Policy, since the enactment of the 'No Child Left Behind' federal education policy (NCLB), 44 percent of districts surveyed have reduced time for social studies. That percentage rose to 51

percent in districts with ‘failing schools.’ Denying students opportunities to build social studies vocabulary and background knowledge by engaging in social studies activities can lead to lower literacy levels and, ironically, increase the achievement gap,” (National Council for Social Studies, 2017, para 2).

The failing schools, such as those mentioned here, typically end up being urban schools (Olson, 2006; Winstead 2011; Fitchett, Heafner & VanFossen, 2014; NCSS, 2017). The students in these schools are spending less time learning about history and government, which would put them in a disadvantage in comparison to their peers that have more time in their social studies curricula. With ESSA going into effect, some states may choose to include social studies scores into their school evaluation, causing a shift in the focus that was noted in the wake of NCLB.

With social issues currently surrounding young members of urban areas, students need to be informed of their role as a citizen, their rights, and how current events connect with the past. The former Secretary of Education, Arne Duncan, warned about the risks involved with students missing out on social studies instruction in 2011.

“To be sure, reading and mathematics are essential subjects. Students wouldn’t be able to learn about history and civics if they couldn’t read primary source documents and other texts. In addition to reading skills, they need a solid grounding in statistics and math concepts to grasp important principles in economics, geography, and the other social and behavioral sciences. But we absolutely cannot focus exclusively on reading and mathematics to the exclusion of other important disciplines, including social studies, as well as science, the arts, physical education, and others necessary for a well-rounded education. To marginalize social studies for the sake of reading and math is not only

misguided, it is educational neglect. Educators and policymakers need to recognize that social studies is a core subject, critical to sustaining an informed democracy and a globally competitive workforce,” (Duncan, 2011).

Social studies at the elementary level is meant to teach students about the past and how to be a productive member of society (NCSS, 2017). Historical thinking can also be taught to allow students to apply the past to current events, as well as recognize points of view in historical context (Brown Buchanan, 2015). Students could use critical thinking of historical text to help make informed decisions as they become the next leaders of our society. Rather than cut time out of the elementary school day for social studies, schools should use social studies as a context for practicing reading, writing, and critical thinking skills.

Benefits of Interdisciplinary Curricula

Time is a valuable thing in the elementary classroom, especially as teachers prepare their students for high-stakes testing (Winstead, 2011). Multidisciplinary lessons can help teachers meet various standards and goals in a shorter amount of class time. Rather than dedicating an hour to science or social studies content, the content could be blended into the time already spent on reading and writing. Teachers struggle with “finding time” to get to science and social studies, ultimately running out of time to cover the content each year (Olson, 2006; Stedman, 2010; Winstead, 2011). When literacy is taught through the lens of science and social studies, students are able to gain content knowledge as well as critical reading and writing skills. When mathematics problems are taught with real-world examples of science or social studies concepts, the math problem no longer seems as abstract (Santos & Semana, 2015). Teaching all four content areas together can help illustrate how the world works, as a continuous application of all

content areas blended together. The blended-view helps students understand the big picture of what they are learning.

Streamlining the student's day, especially in rotating elementary classrooms, can help support the student in gaining content knowledge and skills. If teachers use common structures for writing, problem solving, and procedures, the students will be able to catch on and build their knowledge faster (Kerry, 2015; Rowley & Cooper, 2009). Students will be able to transfer and practice skills as they rotate through classrooms throughout the day. Skill transfer from one course to another must be fostered by the teacher through common language and strategies used by the cooperating teachers in the grade band. This connection is made even more clear when interdisciplinary lessons connect ideas across content areas. Building up the same strategies would also increase confidence for students when they approach a content topic that is difficult for them (Yali & Hoge, 2005; Winstead, 2011). Examples of these strategies include problem solving, reading, and writing based on informational text. Utilizing interdisciplinary lessons as well as using common strategies from class to class helps support the student as a whole learner, building a solid foundation as they move into secondary and higher education.

Problem solving skills. Problem solving is emphasized in mathematics, science, and social studies. However, students have a hard time transferring the way they problem solve from one classroom to another (Al Husni & El Rouadi, 2016). Good problem solving strategies are not unlike the scientific method, yet a divide exists between solving a math problem and conducting an experiment. Problem solving steps typically used are understanding the problem, developing a plan to solve the problem, implementing the plan, and reflecting on the problem (Florida Department of Education, 2010). In an interdisciplinary setting, students would be able

to practice problem solving through a variety of lenses. Utilizing critical thinking, design thinking, or problem-based learning across classrooms helps students prepare for rational decision-making that can be transferred in the real world (Grant & Fisher, 2014). Instruction can be guided toward using the language and practices of scientists and engineers to help incubate the student's problem solving skills for real world application (Grant & Fisher, 2014.) If teachers start looking at thought process as universal, rather than content-specific steps, students can see clear connections across disciplines (MacPhee & Whitecotton, 2011; Norton-Meier, Hand & Ardasheva, 2013).

Students can be taught problem solving strategies that can be used whenever they solve a problem in any context. In 2013, a study was conducted on the impact of student attitudes around content when exposed to one model, the Science Writing Heuristic (SWH) approach.. This study found that students were able to better understand and communicate concepts when taking the SWH approach (Norton-Meier, Hand & Ardasheva, 2013). "The Science Writing Heuristic (SWH) laboratory approach is a teaching and learning tool which combines writing, inquiry, collaboration and reflection, and provides scaffolding for the development of critical thinking skills," (Stephenson & Sadler-McKnight, 2016). The SWH approach has been found to aid students in understanding and thinking critically about content, particularly in science (Norton-Meier, Hand & Ardasheva, 2013; Stephenson & Sadler-McKnight, 2016). The SWH approach is discussed in greater detail in the curriculum overview.

Reading and writing skills. Just as using common language in problem solving skills can support learning across content areas, reading and writing skills can be supported with a universal approach. The writing method students use needs to be uniform across subject areas

(Fisher & Frey, 2013). The same rules should apply for expository and argument writing in response to informational text in any content area. Written explanation of thought process can be beneficial across disciplines to increase communication and critical thinking skills (Santos & Semana, 2015). Reading and writing skills are easily transferred to science and social studies when explicitly taught. Reading strategies, such as annotating text, can be used in all classes (Fisher & Frey, 2014). Any informational text could be treated the same way across classes, using close reading techniques (Saccomano, 2014). Using the same format for underlining, highlighting, and other text annotation would reinforce the strategies the ELA teacher teaches the students. Students in elementary schools will need these skills because colleges and careers require students to read and write about complex informational text (Common Core State Standards Initiative, 2017). In order to prepare students for standardized tests aligned to common core, as well as prepare students for adult life and higher education, teachers need to integrate reading and writing strategies throughout the day.

Like problem solving strategies being streamlined, the way students write can be uniform as well. Programs like Step Up to Writing help teachers with formatting student constructed responses (Auman, 2015). With Common Core State Standards focusing on reading and writing strategies in other content areas, teachers are using writing more often in their classes (Common Core State Standards Initiative, 2017). However, for a student to rotate through different classes with different expectations, the task of writing responses can become confusing. Writing an argument about global warming isn't different than writing an argument about whether or not students should have to wear uniforms. The skills for analyzing texts are consistent across subject areas. Having universal formats for writing not only supports the development of writing

skills, but also prevents mixed expectations for quality writing across content (Auman, 2015). A specific example of a writing format is provided in the proposed curriculum.

For courses that have lost time in the elementary schedule, a reading and writing focus can be a way for content knowledge to come back into the curriculum (Winstead, 2011). Social studies can be taught through a variety of context, including expository text, informational stories, historical fiction, and film. In the reading block, students could read and write about historical events and concepts. A study was conducted in 2011 using Laurie Halse Anderson's historical fiction novel *Chains* to help lead into teaching students about the Revolutionary War, (MacPhee & Whitecotton, 2011). The story gives a new perspective of the Revolutionary War from the point of view of a young slave girl in New York (Anderson, 2009). "Because all events have many valuable perspectives, interrogating multiple perspectives is an effective way to develop complex ways of thinking about historical events." (MacPhee & Whitecotton, 2011, p.264). Although fiction is typically unheard of in history and science courses, it can sometimes be valuable in building perspective. Another study in 1993 found that students were able to retain science content better when it was presented as a story, like in the Magic School Bus (Leal, 1993). Reading and writing in content areas can support the reading and writing strategies, as well as develop deeper understanding of the content.

Available Curricula

Multidisciplinary lessons are not a new concept, but they are typically short examples or lack inclusion of a content area (Wicklein & Schell, 1995; Rowley & Cooper, 2009). There are plenty of one-off lessons on websites like Teachers Pay Teachers or Pinterest, but not full curricula dedicated to interdisciplinary classrooms. When researching multidisciplinary or

cross-curricular curricula, the results are how-to manuals on creating interdisciplinary lessons (Rowley & Cooper, 2009). While multidisciplinary curricula do exist, they are often science or social studies, not both. Newer reading curricula include stories about science or social studies topics, thanks to common core, but focus on reading and writing skills and lack logical progression of information within the content area (Common Core State Standards Initiative, 2017). Even in the case of cross-curricular language arts lessons, mathematics gets left out of those multidisciplinary lesson plans (Sturtevant, 1996). Please see Appendix B for a detailed overview of resources used to implement the proposed curriculum.

Conclusion

All of the programs mentioned here have their pros and cons, but they could be used as resources to create a fully interdisciplinary curriculum. The idea of breaking school into subjects is outdated and reflects that the education system may be keeping it in place for convenience (Kerry, 2011). With the continued model of specialized subjects and the emphasis on reading and mathematics test scores in NCLB, science and social studies are pushed to the background in many elementary schools. Schools have fostered a divide among the content areas, which could be rectified with more interdisciplinary lessons. Some schools have students begin rotating to different subject teachers for classes as early as second and third grade. The work is not be easy to tie multiple resources together to form a cohesive curriculum, across multiple classrooms, but it can be done.

Curriculum Overview

This project is an interdisciplinary curriculum intended for use in a fifth grade science and social studies classroom. Parts of the curriculum and schedule are rigid, but can be used as a

guide for what direction the proposed curriculum will go. The science curriculum is set up to be the last year of teaching all areas prior to specializing in middle school, going to Life, Earth, and Physical Science. In social studies, the proposed curriculum is Pennsylvania History, giving all topics from the local perspective. The curriculum is intended for teaching science and social studies in 3 sections of 25-30 students each day. The amount of time given to both courses is shared, given the same time block as Mathematics and Language Arts individually. The students will also be rotating to art, music, physical education, and health classes each week. The language arts curriculum will be the Wonders program, completing from cover to cover in order with supplementary practice. The mathematics curriculum will be the Go Math! program from cover to cover, in order, with supplementary practice. The challenge will be to connect as much of what the other classes are doing within the science and social studies classroom, while also teaching science and social studies content and skills. The class will be provided a set of the Pennsylvania Studies text and a copy of the Interactive Science student edition and teacher edition, but any other supplementary material is teacher-created.

The proposed curriculum will connect to reading and writing skills each day. Every day, students will begin the class period by writing in a journal. This journal will serve as a platform to assess prior knowledge, make predictions, establish communication, and build rapport. Each day, the students will have a prompt as they walk in to write in their journals. Once a week, the teacher will write an entry in each of the approximately 60-75 journals responding to the students' journal entries and asking them clarifying questions about what they wrote or what they think. This process will help the students practice their writing and thinking skills, as well as

develop rapport with the teacher. The journal entries will also help identify how students are comprehending the content and illuminate where students are struggling.

This journal writing process will help develop the students as learners as a whole, not just a vessel to dump unrelated content into each day. Both science and social studies lessons will include practicing reading and writing skills as well. The Pennsylvania Studies and Interactive Science books used in the proposed curriculum both focus on reading and writing strategies in each lesson. The key is to be sure that the skill is practiced in the same way for both content areas, as well as in the same way for the language arts classroom. Whatever writing formats and annotation styles are used in the ELA classroom will be carried over into the science and social studies classroom, to help create common expectations and language regarding the skill practice. The Step Up to Learning writing style will also be used universally across the classrooms as well as grade bands in the school.

Not only will the lessons be connected to language arts through reading and writing skills, but they will be connected to the essential question addressed in language arts each week in the Wonders program. For example, Unit 1 Week 1 in the Wonders program essential question is, “How do we get the things we need?” (August, 2014, pp. 10). In the science and social studies class, students will keep that question going in the perspective of native people of Pennsylvania. In that lesson, activities would include why people live in certain areas, like near rivers, and how they get what they need. Other weeks will have clear content connections, not just essential question connections. Wonders Unit 5 Week 4 has the essential question, “How can scientific knowledge change over time?” (August, et al. 2014, pp. 404). That week’s lesson also includes a story about planets, particularly about Pluto’s ever-changing status as a planet or

not. That week, the science and social studies class would read and discuss the current event latest news article on Pluto, to see where scientists currently stand. The class will also be talking about the solar system at that time as well. The class will be an extension of the language arts classroom, building upon the skills and content they learn with the ELA teacher.

Directly connecting the individual math concepts creates a greater challenge, especially when considering all of the connections already being made with the Wonders program. However, math problems, particularly measurement, data analysis, graphing, and charts, are connected directly with the Interactive Science and Pennsylvania Studies texts. Beyond those pre-made connections, connections will be made directly to Go Math! concepts. In the example of Unit 1 Week 1, the class to be talking about need and native people. For the math connection, students will solve word problems and examples of the math content that week, which is practicing place value, multiplication, and division. Each week, a teacher-created math practice page using word problems that connect to the content in science and social studies. “[...] word problems are just real-life situations involving math. Believe it or not, word problems are actually relevant to your life outside the classroom,” (Steddin, 2004, pp.1). The word problems will help give the students real-world, as well as content, connections from their math class to their science and social studies class. Word problems also give an opportunity to connect math to reading and writing skills. The word problems will also enforce problem solving strategies, like the Scientific Writing Heuristic approach. The Go Math! text also includes the connection to reading, science, social studies, health, and art problems that can be integrated into the classroom as well.

The Scientific Writing Heuristic approach to exploring new content as an effective strategy in all content areas. For example, this approach could be used in learning new mathematical formulas and designing solutions for localized social issues. In Figure 1, specific steps are laid out for both teachers and students for utilizing the method to discover new content.

<u>The Science Writing Heuristic, Part I</u> A template for teacher-designed activities to promote laboratory understanding.	<u>The Science Writing Heuristic, Part II</u> A template for student.
1. Exploration of pre-instruction understanding through individual or group concept mapping or working through a computer simulation.	1. Beginning ideas - What are my questions?
2. Pre-laboratory activities, including informal writing, making observations, brainstorming, and posing questions.	2. Tests - What did I do?
3. Participation in laboratory activity.	3. Observations - What did I see?
4. Negotiation phase I - writing personal meanings for laboratory activity. (For example, writing journals.)	4. Claims - What can I claim?
5. Negotiation phase II - sharing and comparing data interpretations in small groups. (For example, making a graph based on data contributed by all students in the class.)	5. Evidence - How do I know? Why am I making these claims?
6. Negotiation phase III - comparing science ideas to textbooks for other printed resources. (For example, writing group notes in response to focus questions.)	6. Reading - How do my ideas compare with other ideas?
7. Negotiation phase IV - individual reflection and writing. (For example, creating a presentation such as a poster or report for a larger audience.)	7. Reflection - How have my ideas changed?
8. Exploration of post-instruction understanding through concept mapping, group discussion, or writing a clear explanation.	8. Writing - What is the best explanation that explains what I have learned?

Figure 1. The Science Writing Heuristic (Greenbowe, Hand, & Rudd, 2007).

The student template could be retitled to become a universal template for problem solving in any content area. In this way, a science skill can be used to access prior knowledge, brainstorm ideas, develop a plan, and reflect on how the plan worked out. This common method would help students as they work through new content in history, science, and mathematics while practicing reading and writing.

Scope and Sequence

The big question then comes down to time for all of the content, skills, and standards. How can one teacher cover the skills and content of a minimum of four content areas in the same timeframe that the other teachers have for one content area? Carefully crafted routines will help make all of this work manageable each week. One of those strategies is a language arts program called the CAFE. The CAFE is an acronym: Comprehension (C), Accuracy (A), Fluency (F), and Expand vocabulary (E), (Boushey & Moser, 2015). “The acronym CAFE also reflects our desire to have a selection of choices, instead of a set, sequential order of skills arbitrarily assigned by someone who does not know our children,” (Boushey & Moser, 2015, pp. 2). The concept of the CAFE is to give students a list of tasks and let them choose when the tasks will be completed. This is intended to be used in a large reading block as an independent practice section of the lesson across multiple days. In this time, teachers would be able to conference individually with students to help them with skills they need to work on or to pull guided reading groups. This model would be used in the proposed curriculum as an end of the content cycle on Days 5-7 for the entire period, after the warm-up journal entry. These CAFE days will not only give students choice, but allow them to practice skills in reading, writing, math, science, and social studies. The CAFE menu will be further explained in the overview of Days 5-7 in the cycle.

Each Day 1 of the 7 day cycle, after the journal prompt, class would begin with current events tied to that week’s science or social studies content. Current events are essential to helping students understand their world and their place in it. “Among the benefits students often cite, "current events" programs [...] cover a wide range of subjects and connect to all areas of the curriculum. [...] build language, vocabulary, reading comprehension, critical thinking, problem

solving, oral expression, and listening skills. [...] develop informed citizens and lifelong newsreaders. Studying current events helps students understand the importance of people, events, and issues in the news; it stimulates students to explore and learn more about the news, and to pay attention to the news they see and hear outside of school [...],” (Hopkins, 2010, para 4). These current events lessons will help connect the content to the real-world, as well as reinforce reading and social studies skills, even on science content weeks. These news articles will be treated as any other text, practicing close reading and annotating strategies. There are also application and comprehension multiple choice questions that go along with the current event articles to help further practice reading comprehension.

The remainder of class on Day 1, as well as Days 2-4, will be used to learn and practice the new content for each week. This would be the classes of what is commonly referred to as direct instruction. These days will be guided by inquiry learning and exploration of texts. When applicable, connections will be made directly from science to social studies in these content days as well. For example, when talking about Earth’s structure, we will also specifically discuss the geography of Pennsylvania. When discussing inventions and the scientific process, lessons will include inventors from Pennsylvania. These lessons will focus on utilizing universal strategies for close reading, annotating text, writing, and problem solving as it applies to the new content.

After students have tackled the nonfiction texts and new content as a whole group, students will practice reading, writing, and math skills in the CAFE menu on Days 5-7. The menu can be completed in any order the students choose, but they will be numbered for the purposes of explaining the tasks. Task 1 the students will practice vocabulary with the “Glossary Builder.” The students will cut out vocabulary picture and word cards with the new vocabulary

for the cycle. On the backs of the vocabulary cards, students will write the definitions for each word. This will practice their research and writing skills, having to go back into the text to define each word. Task 2 is similar, as the students will practice “Snapchat.” The students will create a picture and a caption representing the new people discussed in the cycle. These people may be explorers, leaders, scientists, inventors, or other important people in history. Again, students practice writing as well as summarizing important ideas and referring back to informational text.

Task 3 and 4 in the CAFE menu is “Read With a Buddy.” Students will find a partner to read through two informational texts related to and expanding upon the content covered in Day 1-4. These articles may be a few pages long and may be above the student’s individual reading level. However, the students will be able to rely on each other to help break down the text. The teacher is also available during the CAFE time to help out as needed, pulling groups that need extra support. Along with reading on-level practice, students can practice annotating the text as well as comprehension and critical thinking questions that go along with the article.

Task 5 and 6 practice skills and content from the cycle. Task 5 is “Skill Practice,” which may be a worksheet practicing map skills, inquiry skills, or problem solving. Task 6 is “Test Prep and Review,” which uses typical test structures of multiple choice and short answer to review content and concepts from the cycle. The test prep allows for practicing test-taking strategies and formats without the stress of constant testing in the classroom.

Task 7 is “Writing,” which will also serve as the end-of-unit summative assessment. Students will be given a prompt that relates to the content of the cycle. Some prompts will require students to make an argument or give an opinion. Other prompts may ask students to

make predictions or inferences. Some prompts may also include an illustration component. For the last cycle in each unit, the writing prompt will be the unit's essential question. This main question will be discussed throughout the unit. Students will use the Step Up to Writing structure for their constructed response to the essential question. In that structure, students will have to cite evidence from the text in order to support two points they make in their response. This formal writing structure will provide support for students in gaining confidence in written communication. This writing structure will also be used in their other classes and may be used on the PSSA open-ended responses.

Task 8 is "Word Problem Practice." This is when students will use their problem solving strategies to work through math word problems. Many of these word problems will need to be created by either the math or the science and social studies teacher. Each of the problems will connect to the current math concept being taught as well as the current content taught in the science and social studies class. For example, the first cycle in unit 1 deals with Native Americans. The first math concept is place value, multiplication, and division. One of the word problems would be about Native Americans planting corn to survive, using multiplication as the math strategy.

Task 9 and 10 allow students to practice reading on their own independent reading level. Task 9 is "Reading Practice" where students will be given a leveled passage that is connected to the content of that cycle. Students will read and annotate these passages on their own, followed by some reading comprehension questions as well. Task 10 is "Book Review," where students will read a nonfiction leveled reader that does not have to be connected to the topic currently being studied. Students will have choice as to which book they read that is on their level.

Students then write a Book Review, which includes a short summary, opinion, and rating of the book. The submitted Book Reviews will be placed in a binder in the classroom library where students may use as a reference when deciding which book they will read next. The book review will practice reading, writing, and reflection skills.

Throughout the week, students will pass between 3 main classrooms, but they won't see clear boundaries between the skills used in the content areas as students once did. Whenever connections can be made to the expressive arts classes, it will be even more helpful. As students learn about native people in week 1, students could also do an art project related to Native Americans. Perhaps the students could learn to use a traditional native drum in music class. Ideally, as students pass from class to class, they would be having an overarching experience of the concepts they learn throughout the day, week, unit, and school year.

Evaluating Effectiveness

The purpose for the proposed curriculum is to support student growth in all content areas using universal skills, which stresses the importance of evaluating student progress. The proposed curriculum will be evaluated in a variety of manners to test for effectiveness, such as pre and posttests, benchmarking, and student surveys. At the beginning of each quarter, students will take a pretest on the science and social studies skills and content that will be taught. After the end of the quarter, approximately 4 units, the students will take a posttest, identical to the pretest, to identify growth students have made within the science and social studies standards. The students will also be benchmarked using the Study Island program for Mathematics and Language Arts. This will also be an indicator of the student's growth in Mathematics and Language Arts, which will be supported by their science and social studies lessons. Students

will also be surveyed throughout the units to see what strategies students felt were conducive to their learning styles. Monitoring of student success and lesson pacing will also need to be evaluated and adjusted on a case-by-case basis.

Potential Challenges

Challenges may present themselves as the year progresses, such as time allotment, communication, and other administrative expectations. Students may need the lesson cycles stretched out longer in order to provide adequate time for students to successfully master the concepts. This could also pose a problem with keeping their classes generally aligned. Students may excel in their mathematics concepts, but need extended time in Language Arts. This would mean that the teachers will need continuous dialogue about pacing to help keep the science and social studies course aligned to both Wonders and Go Math! Wonders is intended to be a 5-day cycle, but the time block allotted for 5th grade ELA is not long enough to encompass all that the Wonders program involves. This means that the ELA class will actually run in 7-day cycles, but may spill over beyond that. There also is not a focus on genre writing in the Wonders program, so those writing units will be included in between the Wonders units. The pacing will be tricky, but with communication and flexibility, the units can still run smoothly together. There is a risk of not getting through all of the units as planned.

Another challenge is the Science Fair, which is school-wide expectation that falls on the 4th-12th grade science teachers. The science fair is not only internal, but in preparation for the George Washington Carver Science Fair. The process for researching, designing, experimenting, and communicating the project is long and difficult. The students will have had experience from the prior year, but the task is still daunting. Much of the project will need to be completed in

chunks with heavy guidance. If the project can be managed mostly out of class as homework checkpoints, then the time needed for the science fair should not greatly impact instructional time. The science fair project will be started along with Unit 2: Nature of Science and Unit 3: Design and Function to help incorporate the science fair into the curriculum.

Curriculum Map Overview

The following table maps out the proposed curriculum and how it aligns to the ELA and Math curricula. The proposed science and social studies curricula is intended to create a connection to the content and skills addressed in the ELA and Math curricula, which are rigid in their scope and sequence.

ELA (Wonders)	Social Studies (Pennsylvania Studies and My World)	Science (Interactive)	Math (Go Math)
U1W1: Getting things we need	Unit 1: Pennsylvania's Land and People		Unit 1- Place Value, Multiplication, and Expressions (12 lessons)
U1W2: Rethink Ideas			
U1W3: Experience Nature "Life in Woods" Story		Unit 2: Nature of Science	
U1W4: Technology Ideas	Unit 2 blend: Scientists of PA		Unit 2- Divide Whole Numbers
U1W5: Pros + Cons of Tech, Transportation		Unit 3: Design and Function	(Connect to SS p. 72 Pony Express)
U2W1: Problem Solvers "Constitution" Stories	Unit 3 blend: Design and Function (New Nation)		
U2W2: Getting Information		Unit 4: Growth and Survival (Begin Frog Growth)	Unit 3- Add and subtract decimals
U2W3: Investigating Nature			(Connect to Sci p.134 nutrition)
U2W4: Investigating Nature (Again)			Multiple questions about frogs!
U2W5: Motivation	Unit 5: Growth and Expansion		Unit 4- Multiply Decimals
U3W1: Different Cultures			

U3W2: Plants with Purpose		Unit 6: Ecosystems	Unit 5- Divide Decimals (Connect to Sci p. 230 Rate of speed formula)
U3W3: Patterns in Nature (All expository text)			
U3W4: Benefits of Groups			
U3W5: Explain Past	Unit 7: The Civil War		
U4W1: Kinds of Stories			
U4W2: Taking a Second Look			
U4W3: People for Change “Rosa” “Votes” “Frederick Douglass”	Unit 9: Historical Figures		Unit 6- Add and subtract fractions with unlike denominators (Connect to reading p. 272 summarize)
U4W4: Natural Resources			
U4W5: Expression of Importance			
U5W1: Experiences Change View	Unit 10 blend: PA Resources PA Landforms and Map skills	Unit 10: Resources	Unit 7- Multiply Fractions (Connect to Art p. 310 Scale models)
U5W2: Shared Experiences, adapting “Great Depression” story			
U5W3: Changes in Environment (All 3 stories)			
U5W4: Scientific Knowledge Change (2 stories)		Unit 12: Protecting the Environment	Unit 8- Divide Fractions (Connect to health p.328 Cooking/recipes)
		Unit 13: Earth and Space	
U5W5: Environment (All 3 stories)			

U6W1: Different Groups contribute to cause	Unit 14: Pennsylvania Today		(Connect to Sci p.384 Water cycle)
U6W2: Getting Along			
U6W3: Living thing Adaptations (all 3 stories)		Unit 15: Properties of Matter	Unit 10- Convert units of Measure (Connect to reading p.408 Compare and contrast)
U6W4: Actions impact world			
U6W5: Connect to World		Unit 16: Forces in Motion	
			Unit 11- Geometry and Volume (Connect to Sci p.448 force/building Connect to Reading p. 460 identify details Connect to Art p.466 architecture)

Lesson Plan Format

The following document is an example of the lesson plan format that would be used for each 7-day cycle. The first 4 days of the cycle would involve obtaining new content information and reinforcing skills. The last 3 days of the cycle would be dedicated to student-choice CAFÉ options and teacher-led small group instruction.

GENERAL CYCLE LESSON PLAN- Grade 5 Science and Social Studies									
Lesson Topic(s) / Title(s)		Lesson Topic(s) / Title(s)		Lesson Topic(s) / Title(s)		Lesson Topic(s) / Title(s)		Lesson Topic(s) / Title(s)	
Weekly News Content Day 1		Content Day 2		Content Day 3		Content Day 4		CAFÉ Days 5-7	
Lesson Date	Letter Day	Lesson Date	Letter Day	Lesson Date	Letter Day	Lesson Date	Letter Day	Lesson Date	Letter Day
	AB		AB		AB		AB		AB
PA Core Standard(s)		PA Core Standard(s)		PA Core Standard(s)		PA Core Standard(s)		PA Core Standard(s)	
(Varies)		(Varies)		(Varies)		(Varies)		(Varies)	
Big/Essential Question(s)		Big/Essential Question(s)		Big/Essential Question(s)		Big/Essential Question(s)		Big/Essential Question(s)	
(By Unit)		(By Unit)		(By Unit)		(By Unit)		(By Unit)	
Learning Objective(s)		Learning Objective(s)		Learning Objective(s)		Learning Objective(s)		Learning Objective(s)	
The students will...		The students will...		The students will...		The students will...		The students will...	
Learning Activities/Agenda		Learning Activities/Agenda		Learning Activities/Agenda		Learning Activities/Agenda		Learning Activities/Agenda	
1. Warm Up: -Journal Prompt		1. Warm Up: -Journal Prompt		1. Warm Up: -Journal Prompt		1. Warm Up: -Journal Prompt		1. Warm Up: -Journal Prompt	
2. Weekly News -Read Article Small Group -Answer Questions Small Group -Discuss Whole Group		2. New Content -Read aloud/Activity Whole Group -Interactive Notebook Small Group/Independent		2. New Content -Read aloud/Activity Whole Group -Interactive Notebook Small Group/Independent		2. New Content -Read aloud/Activity Whole Group -Interactive Notebook Small Group/Independent		2. Directions for CAFÉ 3. CAFÉ options (May include Summative)	
3. New Content -Read aloud/Activity Whole Group -Interactive Notebook Small Group/Independent		3. Closure: -Journal Check -Rating		3. Closure: -Journal Check -Rating		3. Closure: -Journal Check -Rating		4. Closure: -Journal Check -Rating	
4. Closure:									

-Journal Check -Rating				
Check for Understanding	Check for Understanding	Check for Understanding	Check for Understanding	Check for Understanding
Journal	Journal	Journal	Journal	Journal
Interactive Notebook	Interactive Notebook	Interactive Notebook	Interactive Notebook	CAFÉ menu items
Homework	Homework	Homework	Homework	Homework
Unfinished Interactive Notebook	Unfinished Interactive Notebook	Unfinished Interactive Notebook	Unfinished Interactive Notebook	Unfinished CAFÉ items
Science Fair Checkpoints	Science Fair Checkpoints	Science Fair Checkpoints	Science Fair Checkpoints	Science Fair Checkpoints
WEEKLY DIFFERENTIATION PLAN				
LOW LEARNERS				
Student Name(s)	Strategies *Consider: Process/Content/Product/Environment			
	Day 1	Day 2	Day 3	Day 4
	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help
				Day 5-7
				Independent pacing Student choice Buddy help Individual check-in
ADVANCED LEARNERS				
Student Name(s)	Strategies *Consider: Process/Content/Product/Environment			
	Day 1	Day 2	Day 3	Day 4
	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help
				Day 5-7
				Independent pacing Student choice Buddy help Individual check-in
SPECIAL EDUCATION STUDENTS				
Student Name(s)	Strategies *Consider: Process/Content/Product/Environment			
	Day 1	Day 2	Day 3	Day 4
	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help
				Day 5-7
				Independent pacing Student choice Buddy help Individual check-in
ENGLISH LANGUAGE LEARNERS				
Student Name(s)	Strategies *Consider: Process/Content/Product/Environment			
	Day 1	Day 2	Day 3	Day 4
	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help	Whole group reading Small group help
				Day 5-7
				Independent pacing Student choice Buddy help Individual check-in

Step Up to Writing

The following documents are the graphic organizer and rubric for the Step Up to Writing formulaic approach to writing using textual evidence. This graphic organizer and rubric will be used in the science, social studies, and ELA class to help give a universal approach to writing a constructed response. This format can be used for argument writing as well as informative writing. Students will be required to cite 2 pieces of evidence from informational text in their writing. This format will be one of the summative assessments for each unit. Students will work toward an essential question each unit, ultimately answering the essential question in their own words, backed with textual evidence. Alternately, this format could be used with details in place of text evidence for non-text based writing.

ESSENTIAL QUESTION: _____

1	Topic Sentence	
2	Introduce 1st Point	
3	Quote for 1st Point	
4	Explain Quote	
5	Introduce 2nd Point	
6	Quote for 2nd Point	
7	Explain Quote	
8	Conclusion	

Step Up to Writing Rubric

Scoring Guide:

- 4- All requirements are met
- 3- Missing 1 part of the requirements
- 2- Missing 2 parts of the requirements
- 1- Out of order
- 0- Missing completely

Description	1- Peer Feedback		2- Self-Reflection		3- Teacher Feedback	
	<input checked="" type="checkbox"/>	Score	<input checked="" type="checkbox"/>	Score	<input checked="" type="checkbox"/>	Score
1. Topic Sentence <ul style="list-style-type: none"> The writer understands and responds to the question. The writer turns the question into the topic sentence. 	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
2. Introduce Point # 1 <ul style="list-style-type: none"> The sentence introduces the writer's first point. The first point is a direct response to the question. 	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
3. Quote for Point # 1 <ul style="list-style-type: none"> The writer provides a quote from the text to prove their 1st point. The writer uses a quotation that proves they understand the reading. The writer correctly uses quotation marks. 	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
4. Explain Quote # 1 <ul style="list-style-type: none"> The writer explains the quotation in their own words. The writer clearly understands the quotation and how it relates to the answer. 	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
5. Introduce Point # 2 <ul style="list-style-type: none"> The writer introduces the second point. The second point is a direct response to the question. 	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

	Peer Feedback		Self-Reflection		Teacher Feedback	
	<input checked="" type="checkbox"/>	Score	<input checked="" type="checkbox"/>	Score	<input checked="" type="checkbox"/>	Score
6. Quote for Point # 2 <ul style="list-style-type: none"> • <i>The writer provides a quote from the text to prove their 2nd point.</i> • <i>The writer uses a quotation that proves they understand the reading.</i> • <i>The writer correctly uses quotation marks.</i> 						
7. Explain Quote # 2 <ul style="list-style-type: none"> • <i>The writer explains the quotation in their own words.</i> • <i>The writer clearly understands the quotation and how it relates to the answer.</i> 						
8. Conclusion <ul style="list-style-type: none"> • <i>The writer includes the two main points of the answer.</i> • <i>The writer summarizes their ideas.</i> 						
Conventions <ul style="list-style-type: none"> • <i>The writer uses complete sentences</i> • <i>The writer uses proper punctuation and capitalization.</i> • <i>The writer spells words correctly.</i> • <i>The writer uses legible handwriting.</i> 						
TOTAL SCORE	/36		/36		/36	

Comments from Peer:

Comments from Teacher:

Unit 1 Overview

The first unit in the science and social studies curriculum is Pennsylvania's Land and People. This unit aligns to the Wonders Unit 1 Week 1 Essential Question, “How do we get the things that we need?” and Week 2 “What can lead us to rethink ideas?” The Go Math! First unit is Place Value, Multiplication, and Expressions, which will be reinforced in the CAFE word problem practice for Unit 1. The students will be reading and practicing skills from the Houghton Mifflin Harcourt Pennsylvania Studies textbook as their main resource, combined with teacher-created resources and other supplemental resources included. Prior to beginning Unit 1, students will take a pretest on information in Unit 1-4 to create baseline data and inform instruction. The following documents include the curriculum standards, essential questions, planned assessments, news articles, interactive notebook pages, and CAFE Menus for Unit 1.

Unit 1 will begin with the journal question “How would you describe the land where you live?,” assessing prior knowledge and practicing writing skills. Students will then read, annotate, and discuss the news article that will launch each new 7-day cycle. Students will then learn about the First Pennsylvanians and the Pennsylvania landforms through reading, writing, interactive notes, and various activities for the first 4 days, starting each class with a journal entry and ending each class with a reflection on their original responses. The last 3 days of the cycle, students will practice what they have learned through various CAFE Menu options, all of which must be completed, but students have the choice as to what order they will be completed in. This time will also be used to hold 1-on-1 conferences with the student and teacher to the address needs as well as small group instruction as needed. The second 7-day cycle in the unit will run the same way, focusing on the formation of the Pennsylvania Colony. The unit will

conclude with students writing an essay answering the essential question, “How does where you live and what you do for a living impact how you live?”



Mariana Bracetti Academy Charter School
Social Studies 5



Individual Elementary Academy > Grade 5 > Social Studies > Social Studies 5 > Week 1

Unit 1- Pennsylvania's Land and People

Berg, Christianna

Stage 1: Desired Results

PA Core Standards

PA: PA Core - Reading for History and Social Studies

PA: Grade 6-8

Reading Informational Text

Key Ideas and Details

- CC.8.5.6-8.A. Cite specific textual evidence to support analysis of primary and secondary sources.
- CC.8.5.6-8.B. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
- CC.8.5.6-8.C. Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

Craft and Structure

- CC.8.5.6-8.D. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

Integration of Knowledge and Ideas

- CC.8.5.6-8.G. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

PA: Civics and Government 2009

PA: Grade 8

5.1 Principles & Documents of Government

Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:

- 5.1.8.C. Analyze the principles and ideas that shaped local, Pennsylvania, and national governments. • Liberty / Freedom • Democracy • Justice • Equality

PA: Geography 2009

PA: Grade 8

Geography

7.4. Interactions Between People and the Environment

- 7.4.8.A. Illustrate the effects of the physical systems on people

PA Assessment Anchors

PA: Social Studies Assessment Anchors

PA: Keystone: Civics & Governm

MODULE 2—Citizenship in Modern Democracies

C.2.4 Competing Interests and Ideas

C.2.4.1 Critique the various roles that individuals, symbols, and symbolic events play in civic discourse.

- C.2.4.1.2 Explain the various roles that political symbols, symbolic events, and individuals play in uniting groups and people in support of common causes.

within regions.

MBA Learning Goal(s)

- Use prior knowledge to explore authentic problems that require critical and/or creative thinking.
- Deliberately use language (written, verbal, numerical, and symbolic) to create expression and communicate feeling.

Enduring Understandings

Enduring Understanding

School Wide

Social Studies

Enduring Understanding

- Group identity is grounded in common pursuit of an end result or camaraderie from shared participation in an experience.
- Historians and social scientists work to explain what happened through a continuous process of questioning, research, analysis, and interpretation.
- Movement of population depends upon availability of resources and perception of security.
- People are connected by shared experience, identity, and/or mutual compassion for one another.

Essential Questions

Essential Questions

School Wide

Social Studies

Essential Questions

- How does where you live (and what you do for a living) impact how you live?

Learning Objectives

Knowledge/Content

14 days

The students will...

- identify and describe Pennsylvania landforms and regions
- describe how locations and landforms impact climate
- describe how prehistoric people migrated to North America
- describe how ancient people used land
- compare and contrast Native American cultures
- identify reasons why explorers came to the Americas
- describe daily life in colonial Pennsylvania
- describe the relationship between colonists and Native Americans

Critical Vocabulary

climate, migrate, artifact, culture, adapt, explorer, charter, economy, rural

Key Concepts/Academic Vocabulary (if applicable)

region, landform, elevation, wigwam, longhouse, wampum, legend, compass rose, map scale, settlement, colony, debt, tolerance, assembly, veto, immigrant, industry, trade

Stage 2: Evidence

[Written Assessment Best Practices](#)
[Performance Assessment Best Practices - GRASPS](#)

Students Measure of Success

Students Measure of Success

Grade 4

Learning Targets

Reading Growth

- 90% of students on-pace for reading practice

Study Island Reading/Math/Science Benchmark Assessments

- 10 % gain from Benchmark 1 to Benchmark 2

Assessments

Quarter 1 PreTest

Diagnostic: Selected Response: Multiple Choice

Unit 1 Journals

Formative: Written: Journal/ Diary

Warm Up Activity-

Students will respond to the following prompts in their journal:

Part 1-

1. How would you describe the land where you live?
2. How has your neighborhood changed over time?
3. How does the environment shape how we live?
4. Do you speak the same language as the people near you?
5. How did the native Pennsylvanians get the things they needed?
6. What is something you were surprised or excited about in this part of the unit?
7. Summarize this part of the unit.

Part 2-

1. When you go to a new place, do you bring something from home to make you feel comfortable?
2. What does tolerance mean to you?
3. How have you changed as you have gotten older?
4. What does urban mean to you?
5. Take their place: Write about a day in the life of a person in colonial Pennsylvania.
6. What is something you were surprised or excited about in this part of the unit?
7. Summarize this part of the unit.

Unit 1 Interactive Notebook

Formative: Written: Interactive Student Notebook

Various reading and writing practice connected to text.

 [Gr5 Interactive Notes Unit 1](#)

Unit 1 CAFE

Written: Informative

Students complete tasks on a CAFE menu across two class periods per week. Unfinished work becomes homework.

 [Gr 5 Unit 1 CAFE](#)

Unit 1 Essential Question Essay

Summative: Written: Informative

How does where you live and what you do for a living impact how you live?

Cite 2 pieces of text evidence.

Same writing layout as used in ELA class.

Stage 3: Learning Plan

Required Resources

Recommended Resources

Houghton Mifflin Harcourt *Social Studies- Pennsylvania Studies*
Chapter 1 pg. 1- 19

Pearson *My World- Building Our Country*
Chapter 1: The First Americans pg.1- 17

ELA: Connection to *Wonders*-
Unit 1 Week 1- How do we get the things that we need?
Unit 1 Week 2- What can lead us to rethink ideas?

Math: Connection to *Go Math!*-
Unit 1- Place Value, Multiplication, and Expressions

Teacher Resources

Lesson Plan

[Weekly Lesson Plan](#)

[Daily Lesson Plan](#)

[Differentiation Strategies](#)

[Strategies for Supporting Struggling Students](#)

 General Weekly Plan- Gr 5.docx

 5th grade curriculum map

Sample News Article

NEWSLA

States bringing more Native American culture, history into classrooms

By Stateline.org, adapted by Newsela staff on 09.15.16

Word Count **328**



Adrienne Cypress (center) and RickeyJoe Alumbaugh (right center) help take care of a garden during a sixth-grade culture class at the Ahfachkee school at the Big Cypress Seminole Indian Reservation, Florida, April 4, 2007. About 20 percent of the school's funding comes from the federal Bureau of Indian Education, with the rest coming from the Seminoles. AP Photo/Luis M. Alvarez

WASHINGTON, D.C. — Forty school teachers stood in a field on the Spokane Indian Reservation.

The teachers prayed and offered gifts. They learned about the Spokane tribe. They were doing this to get their Native American students more interested in school.

In Washington, and across the country, Native American students struggle to stay in school. They struggle more than any other racial group.

NEWSELA

South Dakota And Washington State Make Big Changes

This year, more states are helping. States with many Native American students are training teachers. These include states like South Dakota and Washington. The states are working with tribes to make better programs. They are trying to include more Native American culture in their lessons. The states are also giving money to schools with many Native American students.

Native American Students Need More Help

A new education law passed last year. The law asks schools to do more for Native American students.

As teens, Native American students are more likely to be out of school than students of other races.

They are most likely to have parents without jobs.

Students in Wellpinit schools in Washington often do not have Internet at home. They do not have a good way to get to school. They may live in unsafe homes. They may not have a home.

Tribes Getting More Influence

Some states are giving tribes more power. Still, many students are not improving.

Students are taught from a "white-privileged point-of-view," said John McCoy. He is a lawmaker from Washington. This causes them to struggle.

Other Problems Outside Of Schools

Troy Heinert said school is not valued enough on Native American reservations. He is a lawmaker from South Dakota. He is also part of the Rosebud Sioux tribe. He used to teach at a reservation school.

Heinert said some students take buses to school. School might be far from where they live. If they miss the bus, they miss school. This is a problem that needs to be fixed, too.

NEWSLA

Quiz

- 1 Which selection from the article explains why getting to school is a problem for some Native American students?
 - (A) In Washington, and across the country, Native American students struggle to stay in school.
 - (B) Students in Wellpinit schools in Washington often do not have Internet at home.
 - (C) Some states are giving tribes more power. Still, many students are not improving.
 - (D) School might be far from where they live. If they miss the bus, they miss school.

- 2 Select the paragraph from the section "Native American Students Need More Help" that shows states are trying to help Native American students.

- 3 Which sentence from the article describes the main idea of the article?
 - (A) The states are working with tribes to make better programs.
 - (B) They are most likely to have parents without jobs.
 - (C) They may live in unsafe homes.
 - (D) School might be far from where they live.

- 4 What is the main idea of the section "Native American Students Need More Help"?
 - (A) A new education law tells schools that they need to do more for schools with Native American students.
 - (B) Native American students are more likely to have no home, live in an unsafe home or have parents without jobs.
 - (C) Native American students are more likely to struggle and be out of school than other students, so a new law was passed to help them.
 - (D) Many Native American students do not have the Internet or a good way to get to school.

Sample Unit 1 Interactive Notes Pages and CAFE Menus


Name: _____ Class: _____ Date: _____

Unit 1- Pennsylvania's Land and First People

Part 1- The First Pennsylvanians

Lesson 1: Land and Water

Objective: I will _____



Pennsylvania's Land

Write the **main idea** about Pennsylvania regions, and add **details** to support it.

Main Idea:		
Detail 1:	Detail 2:	Detail 3:

Map Skill: Through which three regions does the Susquehanna River flow?

glue map here

Describe the landforms and other features of the Allegheny Plateau.

Pennsylvania's Climate

Write the **main idea** about Pennsylvania climate, and add **details** to support it.

Main Idea:		
Detail 1:	Detail 2:	Detail 3:

In what way are the climates of the Erie Lowland region and the Ridge and Valley region different?

Lesson 1 Review:

1. Pennsylvania is located in the Mid-Atlantic _____ of the United States.

2. Name two **details** that tell about this **main idea**:

Pennsylvania has five main land regions:	

3. What landforms do Pennsylvania's regions have?

4. Name two factors that affect Pennsylvania's climate.

5. **Compare and Contrast:** Choose two Pennsylvania land regions:

Region 1:	Region 2:
Similarities:	

6. How does the water cycle affect climate?

glue water cycle here

Why it matters...

Name: _____ Class: _____ Date: _____

Cafe Menu:

Unit 1 Part 1

All tasks must be completed between Days 5-7, but you choose the order in which they are completed.

- ☐ Glossary Builder- new words
- ☐ Snapchat- new people
- ☐ Map Skills- Map Format
- ☐ Read with a Buddy: *Ancient American Civilizations*
- ☐ Read with a Buddy: *Native American Cultures*
- ☐ Writing- *How does the environment shape how we live?*
- ☐ Word Problem Practice
- ☐ Reading Practice- *Sarah Winnemucca*
- ☐ Review and Test Prep
- ☐ Book Review- choose from the nonfiction classroom library

Any incomplete work must be finished as homework.

Name: _____ Class: _____ Date: _____

Cafe Menu:

Unit 1 Part 2

All tasks must be completed between Days 5-7, but you choose the order in which they are completed.

- ☐ Glossary Builder- new words
- ☐ Snapchat- new people
- ☐ Map Skills- Use Latitude and Longitude
- ☐ Read with a Buddy: *Daily Life in the Colonies*
- ☐ Read with a Buddy: *Slavery in the Colonies*
- ☐ Critical Thinking- *Comparing Viewpoints*
- ☐ Word Problem Practice
- ☐ Review and Test Prep
- ☐ **Summative:** Essential Question Essay- *How does where you live and what you do for a living impact how you live?*
- ☐ **Bonus:** Book Review- choose from the nonfiction classroom library

Any incomplete work must be finished as homework.

Unit 2 Overview

The second unit in the science and social studies curriculum is the Nature of Science. This unit aligns to the Wonders Unit 1 Week 3 Essential Question, “How can experiencing nature change the way you think about it?” and Week 4 “How does technology lead to creative ideas?” The Go Math! First unit is still practicing Place Value, Multiplication, and Expressions, which will be reinforced in the CAFE word problem practice for Unit 2. The students will be reading and practicing skills from the Pearson Interactive Science textbook as their main resource, combined with teacher-created resources and other supplemental resources included. The following documents include the curriculum standards, essential questions, planned assessments, and CAFE Menus for Unit 2.

Unit 2 largely focuses on the scientific process and problem solving practice. Students will still begin the 7-day cycle with a news article and each class with a journal entry. This unit will also include multiple science experiments to help practice using the scientific process. The Interactive Science text already includes its own interactive notes pages, so they will not need to be teacher-created as with the social studies text. Students will spend the first 4 days in the cycle reading, writing, and experimenting, followed by 3 CAFE days. The unit will conclude with students writing an essay in response to the essential question, “Where does new knowledge in science come from? Why didn’t they get it before?”



Mariana Bracetti Academy Charter School
Science 5



Individual Elementary Academy > Grade 5 > Science > Science 5 > Week 1

Unit 2: Nature of Science

Berg, Christianna

Stage 1: Desired Results

PA Core Standards

PA: PA Core - Reading for Science and Technical Subjects

PA: Grade 6-8

Reading Informational Text

Key Ideas and Details

- CC.3.5.6-8.A. Cite specific textual evidence to support analysis of science and technical texts.
- CC.3.5.6-8.B. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- CC.3.5.6-8.C. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Craft and Structure

- CC.3.5.6-8.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

PA Assessment Anchors

PA: Science Assessment Anchors

PA: Grade 5

The Nature of Science

S.5.A.1 Reasoning and Analysis

S.5.A.1.1 Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (visuals, scenarios, graphs).

- S.5.A.1.1.1 Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., investigate to find out if all clay or foil boats designs react the same when filled with paperclips).
- S.5.A.1.1.2 Explain how observations and/or experimental results are used to support inferences and claims about an investigation or relationship (e.g., make a claim based on information on a graph).
- S.5.A.1.1.3 Describe how explanations, predictions, and models are developed using evidence.

S.5.A.2 Processes, Procedures, and Tools of Scientific Investigations

S.5.A.2.1 Apply knowledge of scientific investigation or technological design to make inferences and solve problems.

- S.5.A.2.1.1 Design a simple, controlled experiment (fair test) identifying the independent and dependent variables, how the dependent variable will be measured and which variables will be held constant (e.g., relate the effect of variables [mass, release height, length of string] to number of swings of a pendulum, investigate the relationships between variables in paper airplane designs).
- S.5.A.2.1.2 Describe relationships between variables through interpretation of data and observations (i.e., make predictions for the outcome of a controlled experiment using data tables and graphs).

MBA Learning Goal(s)

- Use prior knowledge to explore authentic problems that require critical and/or creative thinking.
- Deliberately use language (written, verbal, numerical, and symbolic) to create expression and communicate feeling.
- Revise work to hone information, ideas, inquiry, and craft.

<h2>Enduring Understandings</h2> <h3>Enduring Understanding</h3> <p>School Wide</p> <p>English</p> <p>Enduring Understandings</p> <ul style="list-style-type: none"> • A good reader determines the author's purpose, identifies the main idea, makes inferences, and summarizes essential information. • A reader uses prior knowledge, context clues, and reference sources to understand unfamiliar words. <p>Science</p> <p>Enduring Understanding</p> <ul style="list-style-type: none"> • By varying just one condition at a time, scientists can hope to identify its exclusive effects on what happens. • Scientific inquiry is a thoughtful and coordinated attempt to search out, describe, explain, and predict natural phenomena. 	<h2>Essential Questions</h2> <h3>Essential Questions</h3> <p>School Wide</p> <p>Science</p> <p>Essential Questions</p> <ul style="list-style-type: none"> • Where does new knowledge in science come from? Why didn't they get it before? • What is science?
<h2>Learning Objectives</h2> <p>Knowledge/Content 14 days</p> <p>The students will...</p> <ul style="list-style-type: none"> • identify how scientists use inquiry to learn about the world around them • describe how scientists investigate problems • describe how scientists collect and interpret data using tools • identify lab safety • describe how scientists draw conclusions using evidence 	
<h2>Critical Vocabulary</h2> <p>hypothesis, observation, experiment, data, evidence</p>	<h2>Key Concepts/Academic Vocabulary (if applicable)</h2> <p>conclusion, variable, control group, procedures, precision, accuracy, inference</p>
<h2>Stage 2: Evidence</h2>	
<p>Written Assessment Best Practices Performance Assessment Best Practices - GRASPS</p>	
<h2>Students Measure of Success</h2>	<h2>Assessments</h2> <p>Unit 2 Journals Formative: Written: Journal/ Diary Warm Up Activity- Students will respond to the following prompts in their journal:</p>

Part 1-

1. What do scientists do?
2. How do scientists investigate?
3. How do scientists collect and interpret data?
4. Why do scientists use scientific inquiry?
5. What is something that you would like to investigate?
6. What is something you were surprised or excited about in this part of the unit?
7. Summarize this part of the unit.

Part 2-

1. How do scientists support their conclusions?
2. What questions do scientists ask?
3. How does a banana slice change over time?
4. Why do scientists keep finding out new things?
5. How do scientists use tools to learn more about their world?
6. What is something you were surprised or excited about in this part of the unit?
7. Summarize this part of the unit.

Unit 2 Interactive Notebook**Formative: Written: Interactive Student Notebook**

Various reading, writing, and questions responding to text.
(From Pearson Interactive Science Notebook)

Unit 2 CAFE**Formative: Written: Informative**

Students complete tasks on a CAFE menu across two class periods per week. Unfinished work becomes homework.

 [Gr 5 Unit 2 CAFE](#)

Unit 2 Essential Question Essay**Summative: Written: Informative**

Where does new knowledge in science come from? Why didn't they get it before?

Cite 2 pieces of text evidence.
Same writing layout as used in ELA class.

Stage 3: Learning Plan

Required Resources

Recommended Resources

Pearson *Interactive Science*
Skills Handbook Part 1: *The Nature of Science*

ELA: Connection to *Wonders*-
Unit 1 Week 3- How can experiencing nature change the way you think about it?
Unit 1 Week 4- How does technology lead to creative ideas?

Math: Connection to *Go Math!*-
Unit 1- Place Value, Multiplication, and Expressions
Unit 2- Divide Whole Numbers

Name: _____ Class: _____ Date: _____

Cafe Menu:

Unit 2 Part 1

All tasks must be completed between Days 5-7, but you choose the order in which they are completed.

- ☐ Glossary Builder- new words
- ☐ Snapchat- new people
- ☐ Read with a Buddy: *Scientific Detectives*
- ☐ Read with a Buddy: *New Ideas in the Colonies*
- ☐ Writing- *Why do scientists do the exact same experiment that other scientists have done?*
- ☐ Word Problem Practice
- ☐ Review and Test Prep
- ☐ Skill Practice- *The Scientific Method*
- ☐ Reading Practice- *Testing a Theory*
- ☐ Book Review- choose from the nonfiction classroom library

Any incomplete work must be finished as homework.

Name: _____ Class: _____ Date: _____

Cafe Menu:

Unit 2 Part 2

All tasks must be completed between Days 5-7, but you choose the order in which they are completed.

- ☐ Glossary Builder- new words
- ☐ Snapchat- new people
- ☐ Read with a Buddy: *Taking Heat*
- ☐ Read with a Buddy: *Safety First*
- ☐ Word Problem Practice
- ☐ Review and Test Prep
- ☐ Reading Practice- *Safety in Science*
- ☐ Skill Practice- *Safety in the Laboratory*
- ☐ **Summative:** Essential Question Essay- *Where does new knowledge in science come from? Why didn't they get it before?*
- ☐ **Bonus:** Book Review- choose from the nonfiction classroom library

Any incomplete work must be finished as homework.

Unit 3-16 Overview

The proposed curriculum only includes Unit 1-6. The remaining units from 3-16 continue to follow this pattern of 7-day cycles. Students will continue to read and discuss news articles at the beginning of each 7-day cycle and write in their journals daily. In some cases, science and social studies will not only blend with the Wonders and Go Math! curriculum, but with each other as well. In Unit 3: Design and Function, the lines become blurred between science and social studies. Students will learn about the design process and how things can be designed for various function and need. Then, students will learn about the design of the Declaration of Independence and the Constitution in Philadelphia and the problem solving strategies the authors had to go through to create a document for the needs of the Early Americans.

Unit 1-4 will be covered within the first quarter of the year. The pretest will be administered before Unit 1 and the post-test will be administered after Unit 4. The pre- and post-test will consist of multiple choice questions about the skills and content taught in the quarter. A new pretest will be administered before Unit 5 and the post test will be administered after Unit 8. This pattern will continue each quarter through Unit 16. The following documents include the standards, essential questions, and planned assessments for Units 3 through 6. Unit 3 is broken into 2 documents. The proposed curriculum is intended for an interdisciplinary classroom, but the program the curriculum is planned in only allows for single-subject curriculum writing. Although the documents are separate, the unit will be treated as a continuous idea, applying the design process to the founding documents of the United States of America.



Mariana Bracetti Academy Charter School
Science 5



Individual Elementary Academy > Grade 5 > Science > Science 5 > Week 1

Unit 3: Design and Function

Berg, Christianna

Stage 1: Desired Results

PA Core Standards

PA: PA Core - Reading for Science and Technical Subjects

PA: Grade 6-8

Reading Informational Text

Key Ideas and Details

- CC.3.5.6-8.A. Cite specific textual evidence to support analysis of science and technical texts.
- CC.3.5.6-8.B. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- CC.3.5.6-8.C. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Craft and Structure

- CC.3.5.6-8.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

Integration of Knowledge and Ideas

- CC.3.5.6-8.G. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- CC.3.5.6-8.H. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
- CC.3.5.6-8.I. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Range and Level of Complex Texts

- CC.3.5.6-8.J. By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Assessment Anchors

PA: Science Assessment Anchors

PA: Grade 5

The Nature of Science

S.5.A.1 Reasoning and Analysis

S.5.A.1.1 Explain, interpret, and apply scientific, environmental, or technological knowledge presented in a variety of formats (visuals, scenarios, graphs).

- S.5.A.1.1.1 Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., investigate to find out if all clay or foil boats designs react the same when filled with paperclips).

S.5.A.2 Processes, Procedures, and Tools of Scientific Investigations

S.5.A.2.1 Apply knowledge of scientific investigation or technological design to make inferences and solve problems.

- S.5.A.2.1.1 Design a simple, controlled experiment (fair test) identifying the independent and dependent variables, how the dependent variable will be measured and which variables will be held constant (e.g., relate the effect of variables [mass, release height, length of string] to number of swings of a pendulum, investigate the relationships between variables in paper airplane designs).
- S.5.A.2.1.2 Describe relationships between variables through interpretation of data and observations (i.e., make predictions for the outcome of a controlled experiment using data tables and graphs).

S.5.A.2.2 Apply appropriate instruments for specific purposes and describe the information the instruments can provide.

- S.5.A.2.2.1 Describe the appropriate use of instruments and scales to accurately measure time, mass, distance, volume, and temperature safely under a variety of conditions (e.g., use a thermometer to observe and compare the interaction of food coloring in water at different temperatures).
- S.5.A.2.2.2 Explain how technology extends and enhances human abilities for specific purposes (e.g., use hand lens to examine crystals in evaporation dishes; use graduated cylinders to measure the amount of water used in a controlled plant experiment).

MBA Learning Goal(s)

- Use prior knowledge to explore authentic problems that require critical and/or creative thinking.
- Use technology tools efficiently and effectively to seek information, problem-solve, collaborate, and communicate.

Enduring Understandings

Enduring Understanding

School Wide

English

Enduring Understandings

- A good reader determines the author's purpose, identifies the main idea, makes inferences, and summarizes essential information.
- A reader uses prior knowledge, context clues, and reference sources to understand unfamiliar words.

Science

Enduring Understanding

- All technologies have effects other than those intended by the design: some of same technologies that have improved the length and quality of life for many people have also brought new risks.
- Generating and testing a hypothesis is the method in which scientists learn about the universe.
- The way scientists conduct an investigation affect its safety, accuracy, precision, reliability, and reproducibility.

Essential Questions

Essential Questions

School Wide

Science

Essential Questions

- How does an improvement in/creation of technological tools expand the capacity of scientists?
- How is this machine used to do work?

Learning Objectives

Knowledge/Content

21 days

The students will...

- identify how technology solves problems and provides solutions.
- describe how technology can mimic the muscular and skeletal systems.
- describe and utilize the design process.
- design an experiment for science fair.

(Blended with Social Studies Unit 3)

- describe how the French and Indian War impacted the Pennsylvania Colony.
- describe why the colonies decided to begin the revolution.
- describe the design and function of the Declaration of Independence and the US. Constitution

Critical Vocabulary

technology, prototype

Key Concepts/Academic Vocabulary (if applicable)

design process, microchip, prosthetic limb

Stage 2: Evidence

[Written Assessment Best Practices](#)

[Performance Assessment Best Practices - GRASPS](#)

Students Measure of Success

Students Measure of Success

Grade 6

Learning Targets

Reading Growth

- 90% of students entering on grade level will demonstrate a growth of at least 1.5 years according to the DRA levels.
- 95% students demonstrate at least 1.5 years reading growth as measured by IRLA

Study Island Reading/Math Benchmark Assessments

- 10 % gain from Benchmark 1 to Benchmark 2

Assessments

Unit 3 Journal

Formative: Written: Journal/ Diary

Unit 3 Interactive Notebook

Formative: Written: Interactive Student Notebook

Unit 3 CAFE

Formative: Written: Informative

Unit 3 Essential Question Essay

Summative: Written: Informative

Stage 3: Learning Plan

Required Resources

Recommended Resources

Teacher Resources

Lesson Plan

[Weekly Lesson Plan](#)

[Daily Lesson Plan](#)

[Differentiation Strategies](#)

[Strategies for Supporting Struggling Students](#)



Unit 3: Design and Function (New Nation)

Berg, Christianna

Stage 1: Desired Results

PA Core Standards

PA: PA Core - Reading for History and Social Studies

PA: Grade 6-8

Reading Informational Text

Key Ideas and Details

- CC.8.5.6-8.A. Cite specific textual evidence to support analysis of primary and secondary sources.
- CC.8.5.6-8.B. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

Craft and Structure

- CC.8.5.6-8.D. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

Integration of Knowledge and Ideas

- CC.8.5.6-8.G. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Range and Level of Complex Texts

- CC.8.5.6-8.J. By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

PA Assessment Anchors

PA: Social Studies Assessment Anchors

PA: Keystone: Civics & Government

MODULE 1—Government: Forms and Functions

C.1.1 Purpose and Functions of Government

C.1.1.1 Evaluate the development and impact of domestic policy.

- C.1.1.1.2 Analyze the role of the federal government in creating, approving, and implementing domestic policy.
- C.1.1.1.3 Define the purposes and functions of governmental and non-governmental organizations in implementing domestic policy.
- C.1.1.1.4 Analyze how the opinions and beliefs of various groups influence policy making at the federal, state, and local levels.

MODULE 2—Citizenship in Modern Democracies

C.2.3 Political Philosophies

C.2.3.1 Analyze the application of civic principles and ideals in contemporary life.

- C.2.3.1.2 Evaluate the impact of influential writings, speeches, and other communications on society in the United States and the world.

MBA Learning Goal(s)

- Use prior knowledge to explore authentic problems that require critical and/or creative thinking.
- Deliberately use language (written, verbal, numerical, and symbolic) to create expression and communicate feeling.

Enduring Understandings

Enduring Understanding

Essential Questions

Essential Questions

School Wide**Social Studies****Enduring Understanding**

- Alliances are based on mutual need (and mutual hatred).
- The past events that become defining moments shape self/national identity and future decisions.
- The way a government organizes itself OR creates/enforces the laws reflects who and what they value.

School Wide**Social Studies****Essential Questions**

- When do individual events become a tipping point?

Learning Objectives**Knowledge/Content****21 days**

The students will...

- describe how the French and Indian War impacted the Pennsylvania Colony.
- describe why the colonies decided to begin the revolution.
- describe the design and function of the Declaration of Independence and the US. Constitution

(Blended with Science Unit 3)

- identify how technology solves problems and provides solutions.
- describe how technology can mimic the muscular and skeletal systems.
- describe and utilize the design process.
- design an experiment for science fair.

Critical Vocabulary

treaty, tax, independence, constitution

Key Concepts/Academic Vocabulary (if applicable)

ally, proclamation, petition, boycott, revolution, loyalist, patriot, confederation, ratify, amendment

Stage 2: Evidence[Written Assessment Best Practices](#)[Performance Assessment Best Practices - GRASPS](#)**Students Measure of Success****Students Measure of Success****Grade 4****Learning Targets****Reading Growth**

- 90% of students entering on grade level will demonstrate a growth of at least 1.5 years according to the DRA levels.
- 95% students demonstrate at least 1.5 years reading growth as measured by IRLA

Study Island Reading/Math/Science Benchmark Assessments

- 10 % gain from Benchmark 1 to Benchmark 2

Assessments**Unit 3 Journal****Formative: Written: Journal/ Diary****Unit 3 Interactive Notebook****Formative: Written: Interactive Student Notebook****Unit 3 CAFE****Formative: Written: Informative****Unit 3 Essential Question Essay****Diagnostic: Written: Informative**



Mariana Bracetti Academy Charter School
Science 5



Individual Elementary Academy > Grade 5 > Science > Science 5 > Week 1

Unit 4: Growth and Survival

Berg, Christianna

Stage 1: Desired Results

PA Core Standards

PA: PA Core - Reading for Science and Technical Subjects

PA: Grade 6-8

Reading Informational Text

Key Ideas and Details

- CC.3.5.6-8.A. Cite specific textual evidence to support analysis of science and technical texts.
- CC.3.5.6-8.B. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- CC.3.5.6-8.C. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Craft and Structure

- CC.3.5.6-8.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

Integration of Knowledge and Ideas

- CC.3.5.6-8.G. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- CC.3.5.6-8.H. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
- CC.3.5.6-8.I. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Range and Level of Complex Texts

- CC.3.5.6-8.J. By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Assessment Anchors

PA: Science Assessment Anchors

PA: Grade 5

The Nature of Science

S.5.A.2 Processes, Procedures, and Tools of Scientific Investigations

S.5.A.2.1 Apply knowledge of scientific investigation or technological design to make inferences and solve problems.

- S.5.A.2.1.1 Design a simple, controlled experiment (fair test) identifying the independent and dependent variables, how the dependent variable will be measured and which variables will be held constant (e.g., relate the effect of variables [mass, release height, length of string] to number of swings of a pendulum, investigate the relationships between variables in paper airplane designs).

S.5.A.3 Systems, Models, and Patterns

S.5.A.3.1 Apply knowledge of systems and patterns to make predictions.

- S.5.A.3.1.1 Make predictions based on patterns in natural systems (e.g., phases of the Moon, time [day, month, and year], weather, seasons).

Biological Sciences

S.5.B.1 Structure and Function of Organisms

S.5.B.1.1 Describe how the cell is the basic unit of structure and function for all living things.

- S.5.B.1.1.3 Compare the structure and function of basic cell parts in organisms (i.e., plants and animals).

S.5.B.2 Continuity of Life

S.5.B.2.1 Explain how certain inherited traits and/or behaviors allow some organisms to survive and reproduce more successfully than others.

- S.5.B.2.1.2 Explain how inherited traits help organisms survive and reproduce in different environments.
- S.5.B.2.1.3 Explain how certain behaviors help organisms survive and reproduce in different environments.

MBA Learning Goal(s)

- Use prior knowledge to explore authentic problems that require critical and/or creative thinking.
- Deliberately use language (written, verbal, numerical, and symbolic) to create expression and communicate feeling.

<h2>Enduring Understandings</h2> <h3>Enduring Understanding</h3> <p>School Wide</p> <h4>English</h4> <p>Enduring Understandings</p> <ul style="list-style-type: none"> • A good reader determines the author's purpose, identifies the main idea, makes inferences, and summarizes essential information. • A reader uses prior knowledge, context clues, and reference sources to understand unfamiliar words. • A writer may use organizational structures and visuals to support comprehension and interpretation of a text and to achieve his/her purpose. <h4>Science</h4> <p>Enduring Understanding</p> <ul style="list-style-type: none"> • The diversity of organisms is the result of natural selection in which organisms with advantageous traits survive, reproduce, and pass on those traits to offspring. 	<h2>Essential Questions</h2> <h3>Essential Questions</h3> <p>School Wide</p> <h4>Science</h4> <p>Essential Questions</p> <ul style="list-style-type: none"> • What are living things made of? How are they organized? • Why is there so much diversity in the world?
<h2>Learning Objectives</h2> <p>Knowledge/Content 14 days</p> <p>The students will...</p> <ul style="list-style-type: none"> • compare and contrast structure and functions of parts of plants and animals. • identify and describe how adaptations help plants survive. • identify and describe how adaptations help animals survive. • identify the stages of metamorphosis. • observe frogs as they go through the stages of their life cycle. 	
<h2>Critical Vocabulary</h2> <p>metamorphosis, adaptation</p>	<h2>Key Concepts/Academic Vocabulary (if applicable)</h2> <p>exoskeleton, extinct species, zoologist</p>
<h2>Stage 2: Evidence</h2>	
<p>Written Assessment Best Practices Performance Assessment Best Practices - GRASPS</p>	
<h2>Students Measure of Success</h2> <h3>Students Measure of Success</h3>	<h2>Assessments</h2> <p>Unit 4 Journal Formative: Written: Journal/ Diary</p>

Grade 6**Learning Targets****Reading Growth**

- 90% of students entering on grade level will demonstrate a growth of at least 1.5 years according to the DRA levels.
- 95% students demonstrate at least 1.5 years reading growth as measured by IRLA

Study Island Reading/Math Benchmark Assessments

- 10 % gain from Benchmark 1 to Benchmark 2

Unit 4 Interactive Notebook**Formative: Written: Interactive Student Notebook****Unit 4 CAFE****Formative: Written: Informative****Unit 4 Essential Question Essay****Summative: Written: Informative****Quarter 1 Summative test****Cornerstone: Selected Response: Multiple Choice****Stage 3: Learning Plan****Required Resources****Recommended Resources****Teacher Resources****Lesson Plan**[Weekly Lesson Plan](#)[Daily Lesson Plan](#)[Differentiation Strategies](#)[Strategies for Supporting Struggling Students](#)



Unit 5: Growth and Expansion

Berg, Christianna

Stage 1: Desired Results

PA Core Standards

PA: PA Core - Reading for History and Social Studies

PA: Grade 6-8

Reading Informational Text

Key Ideas and Details

- CC.8.5.6-8.A. Cite specific textual evidence to support analysis of primary and secondary sources.
- CC.8.5.6-8.B. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
- CC.8.5.6-8.C. Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

Craft and Structure

- CC.8.5.6-8.D. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
- CC.8.5.6-8.E. Describe how a text presents information (e.g., sequentially, comparatively, causally).

Integration of Knowledge and Ideas

- CC.8.5.6-8.G. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Range and Level of Complex Texts

- CC.8.5.6-8.J. By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

PA Assessment Anchors

PA: Social Studies Assessment Anchors

PA: Keystone: Civics & Government

MODULE 1—Government: Forms and Functions

C.1.1.3 Analyze the evolution of civil and human rights and explain the role that governments play in protecting those rights.

- C.1.1.3.1 Analyze the development of historic and contemporary human and civil rights.

C.1.3 Processes of Government

C.1.3.1 Analyze the structure, organization, and operation of various levels of government as they relate to the creation of legislation and the enforcement of laws.

- C.1.3.1.1 Evaluate the structure of the government of the Commonwealth of Pennsylvania with the structure of the U.S. government and compare the process of amending the Pennsylvania Constitution with the process of amending the U.S. Constitution.

MODULE 2—Citizenship in Modern Democracies

C.2.4.3 Analyze the role of media on the creation or resolution of conflict in society.

- C.2.4.3.2 Describe how emerging technologies have influenced political opinions in the United States.

MBA Learning Goal(s)

- Use prior knowledge to explore authentic problems that require critical and/or creative thinking.
- Deliberately use language (written, verbal, numerical, and symbolic) to create expression and communicate feeling.

Enduring Understandings

Essential Questions

Enduring Understanding

School Wide

Social Studies

Enduring Understanding

- Economic opportunities come from investments in human capital and emerging markets.
- The natural resources and location of a place significantly affect the livelihood, politics, and opportunities of the people living there.
- The way a government organizes itself OR creates/enforces the laws reflects who and what they value.

Essential Questions

School Wide

Social Studies

Essential Questions

- How do advancements in technology and science affect the way wars are fought?
- How do migration/population trends affect the lives of people and the character of places?

Learning Objectives

Knowledge/Content

14 days

The students will...

- identify ways Pennsylvania's people and politics changed after the Revolutionary War.
- identify ways inventions and ideas improved transportation in Pennsylvania.
- describe how transportation increased trade and economic activity.
- describe how the Industrial Revolution changed the way people lived and worked.
- identify reasons why Pennsylvanians began to demand more equal rights.

Critical Vocabulary

territory, transportation, canal, textile

Key Concepts/Academic Vocabulary (if applicable)

raid, surrender, negotiate, toll, commerce, refine, mass production, strike

Stage 2: Evidence

[Written Assessment Best Practices](#)

[Performance Assessment Best Practices - GRASPS](#)

Students Measure of Success

Students Measure of Success

Grade 4

Learning Targets

Reading Growth

- 90% of students entering on grade level will demonstrate a growth of at least 1.5 years according to the DRA levels.
- 95% students demonstrate at least 1.5 years reading growth as measured by IRLA

Study Island Reading/Math/Science Benchmark Assessments

- 15 % gain from Benchmark 2 to Benchmark 3

Assessments

Quarter 2 PreTest

Diagnostic: Selected Response: Multiple Choice

Unit 5 Journal

Formative: Written: Journal/ Diary

Unit 5 Interactive Journal

Formative: Written: Interactive Student Notebook

Unit 5 CAFE

Formative: Written: Informative

Unit 5 Essential Question Essay

Summative: Written: Informative



Mariana Bracetti Academy Charter School
Science 5



Individual Elementary Academy > Grade 5 > Science > Science 5 > Week 1

Unit 6: Ecosystems

Berg, Christianna

Stage 1: Desired Results

PA Core Standards

PA: PA Core - Reading for Science and Technical Subjects

PA: Grade 6-8

Reading Informational Text

Key Ideas and Details

- CC.3.5.6-8.A. Cite specific textual evidence to support analysis of science and technical texts.
- CC.3.5.6-8.B. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

Craft and Structure

- CC.3.5.6-8.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

Integration of Knowledge and Ideas

- CC.3.5.6-8.I. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

PA Assessment Anchors

PA: Science Assessment Anchors

PA: Grade 5

The Nature of Science

S.5.A.2 Processes, Procedures, and Tools of Scientific Investigations

S.5.A.2.1 Apply knowledge of scientific investigation or technological design to make inferences and solve problems.

- S.5.A.2.1.1 Design a simple, controlled experiment (fair test) identifying the independent and dependent variables, how the dependent variable will be measured and which variables will be held constant (e.g., relate the effect of variables [mass, release height, length of string] to number of swings of a pendulum, investigate the relationships between variables in paper airplane designs).

Biological Sciences

S.5.B.1 Structure and Function of Organisms

S.5.B.1.1 Describe how the cell is the basic unit of structure and function for all living things.

- S.5.B.1.1.1 Recognize that all organisms are composed of cells.
- S.5.B.1.1.2 Explain the concept of the cell as the basic structural unit of all living things.
- S.5.B.1.1.3 Compare the structure and function of basic cell parts in organisms (i.e., plants and animals).

S.5.B.2 Continuity of Life

S.5.B.2.1 Explain how certain inherited traits and/or behaviors allow some organisms to survive and reproduce more successfully than others.

- S.5.B.2.1.2 Explain how inherited traits help organisms survive and reproduce in different environments.
- S.5.B.2.1.3 Explain how certain behaviors help organisms survive and reproduce in different environments.
- S.5.B.2.1.4 Identify changes in environmental conditions that can affect the survival of populations and entire species.

S.5.B.3 Ecological Behavior and Systems

S.5.B.3.1 Describe the relationships between organisms in different ecosystems.

- S.5.B.3.1.1 Describe the roles of producers, consumers, and decomposers within a local ecosystem.
- S.5.B.3.1.2 Describe the relationships between organisms in different food webs.

MBA Learning Goal(s)

- Use prior knowledge to explore authentic problems that require critical and/or creative thinking.
- Deliberately use language (written, verbal, numerical, and symbolic) to create expression and communicate feeling.

Enduring Understandings

Enduring Understanding

School Wide

Science

Enduring Understanding

- Energy from the sun flows irreversibly through ecosystems and is conserved as organisms use and transform it.
- Living things have common hierarchical cellular structures and characteristics that serve necessary functions for growth, response to stimulus, reproduction, and use of energy.
- Matter and energy needed to sustain life are continually recycled among and between organisms and the environment.
- The health of humans and other organisms is affected by their interactions with each other and their environment and may be altered by human manipulations.
- The level of classification systems is an ongoing effort within the science community so that there are meaningful ways to study groups.

Essential Questions

Essential Questions

School Wide

Science

Essential Questions

- What are the effects of the interactions between organisms and their environment?
- Where does matter/energy come from? Where does it go?

Learning Objectives

Knowledge/Content

14 days

The students will...

- describe how plants use the energy from the sun.
- identify and describe the ways organisms interact in an ecosystem.
- describe how environments change and organisms adapt for survival.
- describe how people can affect the environment and change ecosystems.

Critical Vocabulary

producer, consumer, decomposer, environment

Key Concepts/Academic Vocabulary (if applicable)

prey, predator, photosynthesis, cellular respiration, conservation, food chain, pollution, food web, food chain

Stage 2: Evidence

[Written Assessment Best Practices](#)

[Performance Assessment Best Practices - GRASPS](#)

Students Measure of Success

Assessments

Unit 6 Journal**Formative: Written: Journal/ Diary****Unit 6 Interactive Notebook****Formative: Written: Interactive Student Notebook****Unit 6 CAFE****Formative: Written: Informative****Unit 6 Essential Question Essay****Summative: Written: Informative**

Stage 3: Learning Plan

Required Resources

Recommended Resources

Teacher Resources

Lesson Plan

[Weekly Lesson Plan](#)[Daily Lesson Plan](#)[Differentiation Strategies](#)[Strategies for Supporting Struggling Students](#)

Appendix A

PSSA 2015-2016 Data

The following table includes data about the PSSA scores when the students intended for the proposed curriculum were in 3rd grade. The scores are broken down by percent in each category as well as combined proficient and advanced scores, which is the goal for reaching proficiency.

2015- 2016 PSSA Data (3rd graders at the time)	Below Basic %	Basic %	Proficient %	Advanced %	Combined Proficient and Advanced %
State Wide Data 3rd Grade ELA					54.4
Philadelphia SD General 3rd Grade ELA	35	35	26	4	30
Philadelphia SD Low Income 3rd Grade ELA	37	36	25	3	28
Philadelphia SD Non-low Income 3rd Grade ELA	20	25	39	16	56
Mariana Bracetti Academy CS 3rd Grade ELA	32.9	37	28.8	1.4	30.2
State Wide Data 3rd Grade Math					60.9
Philadelphia SD General 3rd Grade Math	57	21	15	7	22
Philadelphia SD Low Income 3rd Grade Math	59	21	14	5	19
Philadelphia SD Non-low Income 3rd Grade Math	34	22	21	23	44
Mariana Bracetti Academy CS 3rd Grade Math	56.2	19.2	16.4	8.2	24.6
State Wide Data 4th Grade Science					76.2
Philadelphia SD General 4thGrade Science	36	21	31	12	43
Philadelphia SD Low Income 4th Grade Science	38	22	30	10	40
Philadelphia SD Non-low Income 4th Grade Science	21	13	36	31	66
State Wide Data 8th Grade Science					57.7
Philadelphia SD General 8thGrade Science	56	17	19	9	28
Philadelphia SD Low Income 8th Grade Science	59	17	17	6	24
Philadelphia SD Non-low Income 8th Grade Science	33	15	29	23	52

The data in this table was obtained from the Pennsylvania Department of Education and Philadelphia School District.

<http://www.education.pa.gov/data-and-statistics/PSSA/Pages/default.aspx#tab-1>

and

<http://webgui.phila.k12.pa.us/offices/d/district-performance/repository-of-data/2015-2016-pssa--keystone-performance>.

Appendix B

Overview of Resources Used to Implement the Proposed Curriculum

The following curricula programs will be utilized in the implementation of the proposed curriculum. The following information provides an overview of these resources and their effectiveness in an interdisciplinary setting.

Language Arts Focus

The Wonders program, by McGraw-Hill Reading, is full of informational texts in both science and social studies. Within the fifth grade anthology, the Wonders program includes science topics in expository text as well as informational stories. This program is working very hard to stray away from only using fictional stories to practice plot, characterization, and summarization. The same anthology includes social studies narrative nonfiction and expository text (August, 2014). Although the Wonders program includes a lot of informational text, social studies is still a bit left out in comparison to science. There are a few areas where math is integrated through reading charts and graphs. This program helps to build content knowledge in science and social studies for students, but the focus is still on the reading and writing skills, not the story content or critical content skills. There also isn't a direct connection between the stories shared in the anthology and the science and social studies standards for fifth grade. This is possibly due to the lack of consistency from state to state on which topics are covered in science and social studies each year (Marzano, Kendall, National Association of State Boards of Education, & Mid-Continent Regional Educational Lab., A. C. 1996; Stedman, 2010). The common core science and social studies standards focus on reading and writing skills, not specific content knowledge or skills (Common Core State Standards Initiative, 2017). Despite

National Councils for Social Studies and Science, states have the final decision on when science and social studies topics are covered, but the reading and writing skills are defined in Common Core Standards (Common Core State Standards Initiative, 2017). Since the Wonders program is aligned to Common Core, not every state will be able to align the text topics to their science and social studies units to create a support for the content knowledge being taught.

Social Studies Focus

My World Social Studies, by Pearson, focuses on reading strategies, but only brushes on a few math skills. Due of the lack of consistency from state to state regarding social studies standards, it is very difficult to find a text for elementary classes that can be used cover to cover. The “fourth grade” text focuses on regions and geography. The fifth grade text focuses on early American history up to the Civil War (Bennett, Cummins, Kracht, Tatum, & White, 2013). In Pennsylvania, fourth grade social studies standards include history and geography of Pennsylvania. In the Pennsylvania fifth grade standards, social studies includes basic knowledge of the government, (Pennsylvania State Dept. of Education, 2002). However, due to the high-stakes testing of science on the fourth grade PSSA, the social studies content can sometimes be pushed back to later grades (Fitchett, Heafner & VanFossen, 2014). This disconnect between standards and available curricula adds to the gap in social studies content knowledge and skill building. Social studies is never tested, in any grade level, on a high-stakes test. Social studies has taken the back seat when it comes to teacher resources (Winstead, 2011). The My World Social Studies could be a great resource for reinforcing reading and writing skills in social studies, but the schools would be required to purchase multiple texts, then mix and match the

content to meet standards. In doing so, there would be a gap in the reading levels designed for each grade group.

“People have always used stories to teach and to remember. [...] Learning comes alive through storytelling, literacy instruction, and flexible resources. Stories from our world engage students and help develop thoughtful, literate citizens. Lessons apply inquiry processes, practice reading and writing, and involve collaboration and communication skills.” (Pearson Education, 2017, para 1) The Pearson Education Group had good intent with creating this curricula, but it only works well in states where there are not specified standards set for social studies content, or when the standards align to the Pearson curriculum. If states were able to come to an agreement on when social studies content is taught, a curriculum resource like My World would be nationally available.

Houghton Mifflin Harcourt created a Pennsylvania Studies curriculum that addresses the specific Pennsylvania social studies standards, as well as common core reading and writing skills (Pennsylvania State Dept. of Education, 2002; Common Core State Standards Initiative, 2017). The Pennsylvania Studies book includes some graph and chart practice for math as well as some specific science topics that stand out for the unit, like the water cycle. Overall, the text is focused on history, geography, and reading skills, (Cortez, 2012). If this curriculum was blended with others that included more science and math, it would be closer to the goal of teaching the child as a whole through a fully multidisciplinary curriculum.

Mathematics Focus

Houghton Mifflin Harcourt also created a common core mathematics program called Go Math! that integrates reading, science, social studies, health, and art. “In this exciting

mathematics program, there are hands-on activities to do and real-world problems to solve,” (Dixon, et al., 2012, pp.iii). Each chapter includes investigations and real-world connections. The chapters also periodically make specific connections to content and skills from other subject areas. Again, the problem arises where connections do not actually connect to the standards for science and social studies within the grade band (Pennsylvania State Dept. of Education, 2002). The content that does line up to the standards, may not line up with the curriculum at the same time of the year.

For example, Chapter 11 in Go Math! has a “Connect to Science” problem where students solve a math problem involving force and motion, (Dixon, et al. 2012). Force and Motion is taught in Unit 2 for Pearson’s Interactive Science, (Buckley, et al. 2016). This is a prime opportunity for teachers to work together to rearrange lessons to fit better for their students as a whole. However, this is often an issue with finding common planning (Mertens, 2013). This task is easier in cases where the teacher has the same students for the full day, but not impossible for schools where the students rotate classes. This program does focus on real-world application and problem solving, which can be reinforced in other courses like science and social studies.

Science Focus

Pearson’s Interactive Science bridges the gap between the expected science content and the relatable math and reading skills, with an add-on of social studies. Each science unit begins with “My Planet Diary,” which is a specific story applying the content to something happening in the real world. The curriculum includes separate practice books for STEM and Social Studies and Language Arts connection books, with an additional cost (Pearson Education, 2017). Within

the student interactive text, students practice reading and writing strategies, as well as “Do the Math!” problems including computation, graphing, and data analysis. The math practice does not necessarily align with the math standards for the grade band, but focuses largely on data analysis. The students are also asked to draw pictures and diagrams, adding in some expressive arts to the mix. There are also classroom libraries of leveled reader books that can be added as well, helping reach the students at their varied reading levels (Buckley, et al. 2016).

The Interactive Science program makes an effort to connect to all content areas, but it is also an expensive program. Impoverished schools will have a hard time getting all of the program, as resources are limited to begin with (Olson, 2006; Pederson, 2007). Interactive Science comes with lab materials, teacher editions, student consumable editions, and the various teacher resource books. To buy the entire program, with all of the components, for a classroom of 30 students with only 1 ELL student, would cost \$6,132.81, not including tax and shipping costs (Pearson Education, 2017). The price also doesn’t include the cost of replacing the books the following year, since they are intended to be consumable write-in textbooks. The easy solution to a multidisciplinary-based science classroom is out there, if schools can afford it. In theory, you could spend the entire day doing activities using the Interactive Science materials and be able to cover most of the standards in all content areas. When you’re stripped down to just the student edition, the text still makes efforts in reading and math skills as they connect to the science content, but not nearly as far reaching.

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