GAGA! INTERDISCIPLINARY AND INTEGRATED EDUCATION: GEOGRAPHY, ART, AND GLOBAL AWARENESS

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GAGA! INTERDISCIPLINARY AND INTEGRATED EDUCATION: GEOGRAPHY, ART, AND GLOBAL AWARENESS

by

LIEU NGUYEN

Under the Direction of Dr. Melanie Davenport

ABSTRACT

Based on my experience designing and implementing a team-taught course in Art and Geography, called GAGA, at a Charter high school in Atlanta, I conducted this action research in my classroom to solicit student feedback and assess effectiveness of interdisciplinary instruction in an integrated classroom. Results support the benefits of interdisciplinary education, and helped to reveal the strength and weaknesses of each project that my partner and I have created. I intend to continue polishing this course to provide an engaging learning experience for future students. I am eager to showcase the results of my research at future conferences.

INDEX WORDS: Interdisciplinary, Integrated, Art education, STEAM, PBL, Social Studies Education
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LIEU NGUYEN

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Masters of Art Education in the College of the Arts Georgia State University 2018
GAGA! INTERDISCIPLINARY AND INTEGRATED EDUCATION: GEOGRAPHY, ART, AND GLOBAL AWARENESS

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DEDICATION

I would like to dedicate this thesis to my father and mother, Phi Nguyen and Nhung Le. I am grateful for their support in all of my endeavors whether it be in the field of education or any field of my choosing. They encouraged me to explore the field of education and more specifically, the fine arts. Their willingness to support me in my pursuit of becoming an educator, despite knowing the challenges that I would face, has been an instrumental factor in my graduate studies. I chose not to walk for my Bachelors to signify my intent of advancing my education. With this thesis and commencement on May, 2, 2018, I hope to fulfill this promise.
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Lastly, I would like to express my sincerest gratitude to my friend BaoNgoc Nguyen who took on the challenging, sometimes involuntary task of proofreading my thesis. And to my significant other who is deployed on the other side of the world miles away from me – thank you for support and help.
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LIST OF ABBREVIATIONS

DBAE: Discipline Base Art Education

ESPN: Economic, Social, Political, Environment

GAGA: Geography, Art and Global Awareness

GCSS: Georgia Council of Social Studies

PBL: Project Based Learning

NAEA: National Art Educators Association

NCSS: National Council of Social Studies

MR.HELP: Movement, Region, Human Environment Interaction, Economic, Location, Place

STEAM: Science, Technology, Engineering, Art, and Mathematics
1 INTRODUCTION

1.1 Topic Interest

Before starting my graduate study, I had wanted to contribute the wonderful results that my course, Geography, Art and Global Awareness (GAGA,) have yielded for my students, and for myself while teaching secondary art education. This course was the start of my secondary education career when I bid “see you later” to primary education. The journey that I have taken with GAGA has challenged me to make connections not only in geography but across other disciplines as well. As project ideas developed each year, I craved more interdisciplinary; in turn, it has enhance my passion for teaching, igniting my creativity. I feel that I have progressed in interdisciplinary education in a very short period of time in the field of secondary education, but I am eager to learn more.

When I first started teaching, I incorporated other disciplines as best I could. Being the only art teacher in the building and having no one to bounce ideas off, it was difficult to find collaborators. Elective teachers had varying schedules from primary grade teachers, thus, it was hard to find a time to plan a collaborative project. Oftentimes we would briefly mention our projects in passing, but we never found the time to implement meaningful interdisciplinary education, cross curricular learning in a single class. It was hard to plan and implement a project that coincided with a specific grade level content. Either the project idea did not support the integration of art with another academic standard or we were short on time. Eventually, I decided to forego collaborating and tried to incorporate any disciplines which fit into my own primary grade projects. An increasing number of project ideas emerged but they never seemed to coincide with what students were learning in their particular classroom. I either incorporated material students did not learn yet, which supports that art is educational, or taught previously
reviewed material. Reviewing information was not my goal; I wanted to support their learning through simultaneous education that would enhance their understanding of content from a different perspective. My aspiration was to have cross curricular lessons that would be aligned with what students were learning in their immediate classroom.

As an art teacher, I am required to teach art, but I also want to connect art to one’s life, culture, future, and interest. Art has the ability to bring life to virtually any subject through creative sense, vision, and endeavor. Art can spark the mind, induce creativity, and elicit dialogues between different people. With this said, art can be successfully used to illustrate what the mind has acquired through meaningful teaching and learning. Eager to convey this ideology to express the benefits of art in education, I set out to incorporate interdisciplinary education in order to fuel my curriculum. It just so happened that after my second year of teaching, an opportunity presented itself - a new position at Drew Charter Senior Academy. It was no ordinary opening, but rather a unique request to initiate an integrated course between Art and Geography - GAGA.

GAGA was a vision, a seed planted three years ago, which blossomed into a creative course encompassing a number of important goals. The thought of integrating social studies in my art projects on a regular basis, seemed like an exciting venture, so, I enthusiastically took on the challenge. In the early stages, a fellow teacher (social studies) and I collaborated on this innovative course, having no idea whether it would work or not; but had hopes it would yield significant results in the long run. GAGA proved to be an excellent collaboration between Geography and Art highlighting the connections through art history.

For GAGA, an innovative collaborative course, we sought to create a curriculum that intertwined the two disciplines of Geography and Art together. Many creative projects evolved
from this course over the past three years and we modified every unit each year to improve the
course. Annually during the spring, we reflected on our previous year of teaching and we
planned ahead with the end in mind to create an even better project which would highlight the
main theme of each region and introduced new art practices. Once we incorporated student
feedback, we either expanded an existing project or heavily revised it so that incoming students
could identify and relate to it more. Meanwhile, former students expressed their envy for the
new proposed projects, questioning why they were not given this unique opportunity.

One of the most rewarding things about teaching art is that the outcome can look
different depending on how it is taught, presented, and approached. Each year, the content being
taught is the same as outlined by the Georgia Performance Standards; but the approach to each
unit to blend two disciplines together was different each year, thus, different products were
produced by students. Having a range of different projects each year allows us to collect
feedback on what works in terms of integrating Art and Geography.

The feedback I have received from my students piqued my interest in evaluating the benefits
of Art and Geography comingled. In addition, I want to investigate how I can improve my
curriculum each year. Collecting data from students can direct me in the right path to revise my
approach to the GAGA course. I sought substantiation that interdisciplinary education enhances
learning in order to teach an integrated course with confidence.

1.2 Purpose of Investigation

The purpose of this curriculum research is to examine the benefits of art education but
more specifically, the integration of Art with Geography. Personally, I feel that this course has
been a success because I have grown tremendously as a teacher through this course. GAGA has
allowed me to truly implement interdisciplinary education where my co-teacher and I have
worked very hard to create lessons and projects that would address both content areas. Specializing in different academic fields, we have learned so much from each other’s discipline and have gone to the extent of incorporating each other’s content in our own stand-alone classes. Because we have acquired a multitude of information from one another, we can only imagine how much our students are reaping from our integrated course.

In recent years, my partners and I have written proposals to document the success we have achieved through teaching the GAGA integrated course. During our first year of teaching the course, we were accepted to the Georgia Council for Social Studies Conference (GCSS) held in Athens, Georgia. We believe that our innovative integrated course caught the attention of the reviewing committee since it supported interdisciplinary education. During the third year of GAGA, we were accepted to the National Council for Social Studies (NCSS) in Washington and the National Art Educators Association (NAEA) in New York. During these two conferences, we presented our curriculum and student works to attendees and received very positive and constructive feedback. The fusion between the two disciplines to create a single product motivated many attendees to incorporate interdisciplinary lessons and even collaborate among each other.

Following the success from the previous conferences at GCSS, NCSS, and NAEA we gained confidence to submit more proposals for this school year. We were overjoyed when our proposal regarding GAGA was accepted again to NCSS this year, 2017, held in San Francisco. This year’s presentation changed as we approached it from a methodology approach since the former Geography course in Georgia changed to World Geography, creating a shift from our usual region based to a thematic based approach. This thematic approach refers to the practice of implementing an organized concept linking different regions in one unit of study. Considering
NAEA’s theme for the upcoming conference in Seattle is STEAM, we submitted a proposal, *STEAM in a Co-Taught Classroom: Art and Human Geography*, but unfortunately did not get accepted. In the meantime, I submitted a second proposal titled *Drive the Planning for Interdisciplinary/STEAM Teaching*, which was accepted, so I presented with another colleague from Drew. Acceptance to these conferences is an honorable achievement and is an affirmation that the GAGA course has something to offer. These conference presentations have been an encouraging factor in my pursuit of a Master’s degree in Art Education as well as completing my research involving interdisciplinary education in an integrated classroom. I am eager to share my results upon completion of this research at future conferences.

One other important aspect of this research concerns co-teaching. The GAGA course meets every day with instruction units planned between the Social Studies teacher and myself, Art teacher. Without the existence of this partnership, I believe that the GAGA course would not be what it is today. I must admit, the first year administering the GAGA course was not as effective as I’d envisioned, but it resulted in a great learning experience.

Although it was an integrated course, we separated the class into two after one month to better facilitate instruction, so we were very much collaborating separately. At first, we tried teaching each subject in separate rooms, but we found it did not support integrated learning, for a variety of reasons. Being in separated rooms caused a lack in communication between my co-teacher and I. Because we did not work in synch, our style of delivering content did not complement as well as we had initially planned. This led to miscommunication and students expressed their confusion with how the content related to one another very well. Teaching in different classrooms and trying to support each other’s discipline was interdisciplinary, not an

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1 STEAM is a movement in education advocating for science, math, engineering, art, and technology. This movement places an emphasis on art and design in parallel with demands for innovation in the work force.
integrated model of teaching and learning. Interdisciplinary takes place when a second discipline is introduced into a lesson by a single teacher whereas integrated education involves interdisciplinary with co-teachers, each specialized in the content being delivered. Chapter Two of this thesis will compare and contrast interdisciplinary and integrated teaching.

To prevent the GAGA class from having a disconnect as an integrated course, as expressed from previous year’s students, we decided that this course must exist in one single classroom. Having experienced teaching in two separate classes and in a single class, I realized that my student’s feedback led me to restructure GAGA in order to permitted adequate learning. Learning became seamless and we elaborated on the similarities during instruction, made analogies, and associated the two different disciplines to ensure that students can make the connection between what is being taught between Art and Geography. I experienced a profound benefit in co-teaching in the same classroom at the same time, hence, I highly encourage and recommend other educators to pursue interdisciplinary education with this approach to co-teaching when possible.

1.3 Research Aspiration

Prior to this study, the ultimate goal was to obtain quantitative data hopefully in support of my perception of student mastery of content in Art and social studies. Additionally, qualitative data was necessary to help guide me in my instructional path to improve PBL projects for GAGA.

Quantitative data was collected in hopes of presenting numerical gains made by students. Students enrolled in the GAGA course provided assent and parent permission to participate in the research and was assessed weekly as well as at the end of each unit of study. Through the use of comparison, student achievement in both content areas can be assessed. I was hopeful that
the amount of knowledge students had prior to starting any unit in GAGA will be limited to moderate. I expected the average on pre-test scores to be below a 60% due to the fact that each thematic unit in World Geography covers a broad range of topics from every continent. Moreover, art content tends to be extensive in nature especially when artists, cultures, and history are involved; while at the same time a number of students may not be familiar with content specific information.

Once students were exposed to the dynamic relationship that Art shares with World Geography, I was hopeful that students will be able to show improvement on their post-test scores. Granted the opportunity to develop our own curriculum and drive the direction of the GAGA course, I was optimistic that our purposeful planning would deliver mastery of growth to at least 70%. While 70% seems like a rather low score, I have taken into account the different levels of learners that I serve in GAGA.

Because each student has a unique learning style, the way in which a lesson is executed is important in order to tap into their learning. Delivery of content is a crucial aspect of pedagogy which makes a tremendous difference on how students learn, comprehend, establish connections, and retrieve information to perform well. Without constructive feedback from pupils, educators often make assumptions on how well instructional strategies are. This in turn affects how effectively students learn. Often, teachers can recognize if a lesson is effective or engaging enough to foster learning. Lack of engagement in lessons most likely leads to remediation of content and results in loss of time. Because planning precedes implementing a lesson, there are unforeseen disconnections that deter the fluidity in the learning process. Mistakes are noted by educators and are revised appropriately. Meanwhile, we improvised to correct any disconnection as they occur.
Modifying to improve a lesson and to better suit one’s classroom is part of reflective teaching; however, an integral part of reflective teaching also involves taking students’ suggestions into account. Students should have the opportunity to be proactive and contribute to their own learning experience. These suggestions and reflections as part of a more interactive approach comprise the qualitative data I planned to gather in my research.

I am partial to my work because the projects performed in class are my personal creative ideas, so I am reluctant to make drastic changes or scrap the project entirely. Bias hinders growth in my teaching, therefore I welcome constructive criticism to improve my performance. Colleagues can provide suggestions as they conceptualize the project but can only judge the effectiveness of a project through a secondary perspective. On the contrary, students’ suggestions can be considered primary sources as they are actually the ones completing the assignment. I presented a set of reflective questions in hopes of receiving useful and thought provoking responses. The ultimate goal when striving to make GAGA a better course was to solve any sense of disconnect among students on a project. Moreover, identifying any unintentional connection made during the learning process allowed me to address the same connection in future lesson plans.
2 LITERATURE REVIEW

2.1 Interdisciplinary and Integrated Education

Interdisciplinary education is an approach to collaborative and strategic alignment of different disciplines with a focus on promoting connections across two or more disciplines equally to enhance the learning experience. By increasing engagement and critical thinking, this type of approach to education has gained popularity and interest in recent years. We can note the rising interest as it is being implemented in classrooms around the world. This “cognitive process brings together and blend insights from two or more disciplines, resulting in a broader understanding of a complex real-world problem that may lead to new viable solutions” (Everett, 2016, p.22). Juliano Jr. (2002) also see the benefit to interdisciplinary teaching as providing students with opportunities to solve problems and make meaningful connections within their hearts and across disciplines. Interdisciplinary curriculum encourages students to generate new nights and to synthesize new relationships between ideas. (p.3)

Drake (2004) likewise asserts that connections made through an integrated curriculum aims to foster life skills and knowledge.

Interdisciplinary learning across disciplines distinguishes separate subjects and all content are typically taught by a sole instructor (Smilan & Miraglia, 2009). Normally, teachers who follow this approach are experts in their academic field and may be uncomfortable teaching topics beyond their field that somehow relates to the common theme or issue of study; as a result, learning across disciplines usually may not involve significant leaps in understanding compared to an integrated approach (Drake, 1998; Morris, 1995; Smilan & Miraglia, 2009). As mentioned before in Chapter One, the first year of GAGA incorporated interdisciplinary education by
facilitating instruction in two separate classrooms although it was meant to be an integrated course.

An integrated approach differs from an interdisciplinary approach because there are specialized educators who teach specific content compared to one educator tackling all content. This type of approach requires extensive planning as it “involves arranging the existing academic subjects so that they reinforce each other” (Morris, 1995, p.69). For example, GAGA involves one teacher who specializes in social studies and I, Ms. Nguyen, specialize in the art content. Because I am an advocate for STEAM education, we also incorporate other disciplines such as engineering, science, technology, and math in our artistic geography lessons. The GAGA class establishes an interdisciplinary as well as an integrated approach when delivering science and math content. Including math in an interdisciplinary approach in the GAGA class deepens the learning process so students can make connections across discipline lines, creating an environment that is “less threatening while maintaining its rigor” (Wynn, 2012, p.43).

As a course progresses in the setting of an integrated class, it is believed that the connections made between the different disciplines of study should gradually increase over time (Drake, 1998). Students enrolled in the course should not have a disconnection in the integrated course, instead, students should be able see how one discipline associates with the other. A more important takeaway for the students is the realization of how ideas and aspects of everyday life are affiliated since the world is becoming increasing interdependent with globalization (Ulbricht, 1998).

2.2 Benefits of Co-teaching

In an integrated classroom, two or more instructors collaborate to co-teach integrated lessons with substantive instruction which bridges together two distinct disciplines in a single
space (Cook and Friend, 1995). Co-teaching allows for growth as teachers work together to
discover and learn new things from one another. Boundaries are pushed, allowing for each co-
teacher to reach their potential individually, shifting their pedagogical process (Carney, Weltsek,
Hall, & Brinn, 2016; Hartle, Pinciotti, & Gorton, 2015). This shift in pedagogy allows for the
unique learning, exploration and implementation of diverse teaching styles in order to
appropriately respond to unique learners who may not otherwise succeed in the absence of a co-
teacher (Friend, Reising, & Cook, 1993).

According to Prize (2015), in addition to promoting “complementary teaching
competencies in core curriculum and instructional methodology,” co-teaching can also permit
“improved understanding and academic performance and increase self-esteem and confidence”
(p.44). The boost in self-confidence can lead to better room management, better rapport with
students, delivery of lessons, and intrinsic motivation to uncover interdisciplinary connection.
This intrinsic motivation will lead to better relationship between the existing co-teachers in the
integrated class as well as other teachers in the same school. The welcome interaction between
co-teaching in an integrated class can create avenues of diverse collaboration through vertical or
Curriculum provided a number of positive personal teacher reflections on the value of an
integrated curriculum. One of these reflections include “collaboration helps me to think in a
more integrated way… the more I work with teachers, the more I want to work with them”

Other advantages of co-teaching include a positive learning experience of content that
enriches educators professionally. The process of lesson planning is shared as co-teachers
carefully partner content to make the curriculum as seamless as possible. This shared
responsibility of planning extends to workload in terms of grading, facilitating class lessons, and diligently finding creative ways to incorporate interdisciplinary of other content areas within the current integrated course (Prizeman, 2015).

2.3 Purposeful Planning

In order to make successful connections, internal alignment must occur to unpack standards in each content area and strategically group them together in a curriculum map, as addressed by Drake (2004). A curriculum map is an organization method used to chart standards and ideas to create a well-developed integrated project addressing the disciplines involved. Curriculum mapping helps to allocate resources and address specific standards that work well together for a meaningful learning experience. Purposeful planning across disciplines will yield great results and allow for multiple perspectives to be viewed and shared in a group setting (Jones, 2009). This same strategy of providing, internalizing, and responding from unique perspectives was also supported by Friend, Reising, and Cook (1993).

Embracing the approach of integration requires extensive research and ample time for lesson planning in order to reach a successful educational experience. Likewise, having an appropriate understanding of the content is imperative to its delivery in a standalone setting. In interdisciplinary education, the educator provides knowledge while including digital technology as a supplementary tool. Devoting lengthy research time for non-specialized content in this single instructor approach can be reduced through a co-taught integrated classroom. Co-teaching provides a more seamless interdisciplinary education collaboratively to execute the best education possible in their field of expertise - such as an art instructor and the general academic teacher. This does not mean that one is unaware or even oblivious to the other’s content which
he/she does not teach. Together, two educators are able to provide better explanations and a much more enriching educational experience than just one.

Geography, Art, and Global Awareness (GAGA), use curriculum mapping methods to successfully incorporate Art and Geography standards in a creative manner. Our approach to curriculum mapping is very similar to Drake’s (2004) process of scanning standards, clustering common standards and skills, and formulating an authentic product that will challenge our students academically in both disciplines. Successful interdisciplinary planning requires a lot of scaffolding to link the two disciplines together for students to receive maximum independent learning, rooted in Vygotsky’s model, Zone of Proximal Development (Doyle, 2014). Breazeale (2015) quoted “that a balanced approach to interdisciplinary teaching would provide the best opportunity to present such phenomena” (p.24). Purposeful planning by the instructor will enable students to “create, perform, display, analyze, review, and reflect upon their arts-infused lessons and learning across the discipline” (McDonald, 2010, p.4).

Purposeful planning investigates the strategic alignment of Geography and Art standards in order to create a thought provoking project through which students can learn culture, art, history, global issues, human environmental interaction, and physical features of each region. The product, a form of art, depicts a particular culture and topic in Geography as a metaphor of purposeful learning. Beyond the integrated curriculum of Geography and Art, students also learned about science, math, technology, and engineering concepts in the STEAM movement. The underlying rationale for an extensive interdisciplinary approach stems from the idea that all disciplines are interconnected in one way or another. The Story About Bits by Davenport (2005) provides an exceptional metaphor of how disciplines, specialized bodies of knowledge, evolved from the desire to uncover knowledge. Eventually, knowledge of the world became distinct and
isolated as each discipline created a niche - a necessary stop by not the endpoint on the journey to uncover knowledge of the world. Certain individuals in these disciplines began to blur the boundaries of their discipline as they borrowed knowledge to create new ideas – a familiar strategy of combining knowledge and what we called interdisciplinary, a method of deconstructing intellectual walls in order to make connections of the world.

2.4 Art and Social Studies

Art relates to all academic subjects, thus making it easily integrated with other disciplines. I agree with the belief that art is a visual language used since the earliest of times to record history, express ideas, display knowledge, enhance learning, and captivate the attention of an individual that may otherwise not be interested in reading a lengthy text (Dunn, 1995; Eisner, 1972; Goldenberg, 1997; Hatcher, 1999; Hosack, 2013; Vygotsky, 1971).

I believe that including the humanities and social studies with visual arts works well because these disciplines cross path in a variety of ways. Breazeale (2015) concurs stating, “Social studies classes encompasses a wide range of topics; art can generally relate to these topics because of the nature of art as a visual language” (p.16). Cox (1981) supports the integration of both disciplines by asserting "one of the most binding threads between the disciplines is their common heritage- the history and ideas of mankind” (p.10). History is a documentation developed by mankind to voice a time in life while art provides a method of communication when words cannot be expressed (Breazeale, 2015). Art as communication differs from one culture to another because it is “transmitted through a number of channels with different codes and systems” (Hatcher, 1999, p.136). For this reason, art is beneficial in learning cultures and histories of the past and present.
Incorporating social studies, specifically Geography, with the arts helps students discover more diverse cultures by providing students “opportunities to develop their full range of intellectual potentials” (Dobbs, 1988, p.108). In addition to cultural and multicultural education through art, students are exposed to relevant social issues which they may otherwise overlook. The integrated curriculum can help to engage students and retain information better through the various perspectives that art provides.

Research suggests student performance improves with the help of integrating Art in the curriculum (Cox, 1981). For Geography specifically, Smith-Shank (2005) stressed the importance of visual skills in map reading and production. Mapping is a visual way of compacting a “story, concept, pattern, information, and spatial site” into a comprehensible composition (p.149). Understanding maps requires complex cognitive skills especially in today’s technology driven society. The maps created can provide valuable information exposing students to social, political, environmental, cultural, physical, or economic issues around the world.

In addition, according to Taylor (2008) “including the arts in social studies instruction may have pedagogical benefits because the inclusion would facilitate differentiated instruction” (p.236). The advantage for educators and students from social studies and the arts could be astounding when implemented strategically through purposeful curriculum mapping.

The goals of interdisciplinary teaching of the Art and Geography, and all integration, includes promoting innovation, verbal, perceptual, written, motor, observation and collaboration skills to name a few. In a multicultural setting, integrating Art with Geography will tap into various learning styles, allow expression without a specific language, increase achievement and esteem through engaging activities, promote peer interaction, welcome cultural and perspective differences, and develop confidence in independent learning (Goldberg, 1997). Instruction of
Geography through Art will allow students to experience the diverse global community in which they live. Breazeale (2015) asserted that

Quality visual arts instruction gives students opportunities to be proactive learners through direct, firsthand experiences that involve transformative creative processes as well as informative critical thinking process that apply to learning for life. (p.50)

Her statement above is an aspect at the foundation of Piaget’s constructivist theory (p.10). Innovative lessons of the GAGA course can allow children to “express their conception of the world around them” through a creative art form (Goldberg, 1997, p.2).

Humans have recorded history for millennia for example, cave dwellers use visual expression to record the world in which we all live. Since the earliest of times, our ancestors creatively used natural substances to make drawings and record their lifestyle and values on walls; these cave paintings have been useful to historians to track changes in lifestyle and animal life. The arts also contain good information about politics, wealth, and status throughout history in a geographical area through paintings. Humans construct and destroy things as economies change; a painting or photograph is a good record of a place in time. As such, a painting such as Picasso’s Guernica is a significant example of destruction during the Spanish Civil War which documented his reaction to a bombing in a small town (Hosack, 2013). This allows students to capture reactions to current events. Natural disasters can also evolve into an art piece to depict the reaction of a phenomena. Introducing Hokusai’s The Great Wave of Kanagawa can be used to illustrate the artistic side of Geography. Through an artistic depiction of physical features, students will be able to visualize and verbalize the region, characteristics, events, history, and interesting facts associated to the feature. Another example is the Great Western Railway, the steam train, to compare the initial development to the advance modern railways today (Hosack,
Art also explores culture to convey different beliefs, practices, and traditions of the world. Hatcher’s (1999) *Art as Culture* is an insightful resource for understanding how individuals in the past used art to express their culture.

### 2.5 Artistic Expression as Learning Outcomes

In the setting of interdisciplinary instructions, art instruction enables the development of creativity. It allows for true self-expression through exploration and challenges set forth in a positive academic environment. Art contributes to the development of cognitive ability through visual literacy such as nonverbal language, visual metaphors, and body performance (Eisner, 2002). “Through viewing or making art, students’ emotions or bodily response provide information that can be transformed into knowledge strengthening personal meaning and cognition and contributing to the mature development of all facets of a students’ lived experience” (Dalton, 2016, p.94). Furthermore, being engaged in the art making process allows us to “draw relationships and make connections across context” (Dalton, 2016, p. 98; Lowenfeld, 1947). Drake (1998) suggested that Art in an integrated curriculum helps to “excite brain patterns and enhance use in complex reasoning” which is a necessary life skill (p.37). Complex reasoning is imperative, especially during high stakes testing required of students. Drake (1998) provided evidence of this via research data from a study outlined by Oddeleifson, which asserts that students who partake in art courses score higher on the SAT as well as core academic classes. This can be attributed to the fact that integrating art can “challenge students to use reasoning skills- both concrete and abstract-to draw conclusions and formulate ideas” as they are faced with challenging questions or scenarios (Gullatt, 2007, p.211). Moreover, Carney, Weltsek, Hall, and Brinn (2016) proclaimed that “art education as part of the curriculum may work to
close the achievement gap through improving nature and complexity of students’ thinking” (p.232).

Using art as a methodology to foster an engaging learning environment will set forth a meaningful source of expression when individuals take part in imagination, critical thinking, translating, and meaning making (Goldberg, 1997). Taylor (2008) stressed the importance of arts integration in the overall educational experience. The cultural benefits and cognitive enhancement of individuals of all ages are reasons to favor the inclusion of the arts (p.236).

Partaking in the arts develops these skills and assists in a student’s ability to retain information better. Breazeale (2015) provided examples of students whose attention and engagement increased after being exposed to art activities. “Having a greater engagement means that students will find deeper meaning and understanding of topics that utilize art as the vehicle for instruction” (p.18).

Assessment of learning is evaluated in the form of language performance, but language does not exist solely in written or verbal forms. Language encompasses a variety of forms ranging from written, verbal, sign language, metaphor, numerical, symbolic, and character to among others (Hartle, Pinciotti, & Gorton, 2015). Artistic expression is a form of visual language which can be presented in a multitude of ways metaphorically, symbolically, and can even include text (Eisner, 2002; Hatcher, 1999). As such, visual arts are a valid form of language to display intellectual learning. Learning through the arts makes it much more interesting as it is engaging, expressive, and can be visually assessed. Goldberg (1997) echoes the belief that art is a reflection of the human experience where expression takes the form of visual execution. This type of literacy using visual language is also known as graphicacy. Graphicacy is a literacy skill that should not be seen as subservient to other forms of literacy because as Kimbell, Stables, &
Green, (1996) stated in Anning’s (1997) article, “the language of images is so much richer than the language of words” and is used in materials such as construction manuals, architectural plans, terrain maps, military field manuals, silent cinemas, and production of portraying emotions (p.221).

As mentioned above, art is a tool often used to engage students in the learning process whether it be learning with the arts, as a hook, or learning through the arts, an activity and product. Learning through the arts in any discipline permits mastery in content when art is a form of expression. Learning takes place when students’ imagination flourishes and meanings are constructed in creative ways (Goldberg, 1997). Goldberg included examples like “creating a dance to express understanding of metamorphosis” writing poems to display mastery of ecology, creating a mini drama to express understanding of a history, and drawing from life to express understanding of nature (p.20). Hosack (2013) gave examples of many schools that took part in constructing Rommel pots from various recycled materials to experiment with pitches showing interdisciplinary across music, art, and science. All the suggestions given allow students to personalize their learning through authentic experiences to construct meaning and express knowledge across the board (Hosack, 2013). The flexibility and complex nature of art allows for infinite possibilities to express understanding and intelligence. The possibilities of the arts allow for children to expand their “potential for creative engagement and diverse ways of thinking, feeling, knowing, interacting, and communicating about themselves, others and their world” (Hartle, Pinciotti, & Gorton, 2015, p. 294).

Visual arts are a great way to induce active participation with a product that can display their understanding and intellectual growth of content in ways a traditional reading and writing performance assessment cannot. In addition, visual arts can help to address the different styles of
learners who may encounter obstacles with verbal and written articulation. Artistic depiction through visual imagery can very well express the intellectual growth of an individual while improving the trait of creativity. Take Gardner (1990), whose theory of multiple intelligences suggests that there isn’t a single direct way to evaluate intelligence; differentiation and adapting teaching styles will help accommodate different learners. Learning and teaching is an ongoing process that will continue to change through the development of knowledge due to the progressiveness of intelligence. Jean Piaget’s (1963) intellectual theory states that “intelligence is an adaptation… life is a continuous creation of increasingly complex forms and a progressive balancing of these forms with the environment” (p.3). If the construction of knowledge and understanding can assume various forms, why not stimulate the process by learning through the arts?

2.6 Benefits at a Glance

Benefits of integrating Art and Geography includes improved engagement, observation, evaluating, reflection, envisioning, and other habits of mind through productivity and collaboration (Donahue, 2010). Teaching art from a Discipline Based Art Education (DBAE)\textsuperscript{2} perspective encourages more awareness of the history surrounding a topic or artist, fosters creative thinking through art production, and cultivates an environment where different perspectives and critical analysis can promote productive discussions. Historical context and learning content through Art will better engage students which will foster greater understanding and higher retention rates. The different aspects of visual literacy provide students with skills to evaluate, interpret and construct data which addresses the different types of intelligences

\textsuperscript{2} Discipline Based Art is an educational approach developed in the 19080s to promote an appreciation of art through art history, aesthetics, art production, and art criticism.
(Gardner, 1990). A curriculum that involves Art will develop cognizance, enhance visual perceptual skills, augment verbal abilities, address different learning styles, and allow children to express themselves in different ways linguistically (Dunn, 1995). The art experience will permit students to create and share meanings, and this in turn will provoke dialogue as it engages the audience through purposeful learning (Hartle, Pinciotti, & Gorton, 2015). Lastly, all skills developed through interdisciplinary and integrated learning serve as robust attributes (problem solving and innovation) that employers seek to meet and fill future demands of the global workplace (Everett, 2016).
3 METHODOLOGY

3.1 Research Question

In this research study, I investigated the qualitative and quantitative goals of the GAGA unit and gained insight with respect to course improvement. Students were assessed in each unit of study through quizzes, tests, projects, artist statements, presentations, study aids, and personal reflections. The following questions guided the research:

1. How is the GAGA curriculum effective or ineffective in terms of learning achievement for students in the two disciplines?
2. What can I acquire from student input to assist in the development of curriculum-based learning in the future?
3. How does self-reflection assist me overall in making course improvements?

This integrated course, GAGA, contains two sections with roughly 30-41 students in each classroom with no distinction in student performance. To elaborate, there are no honor classes offered besides AP Geography, a non-integrated course with higher performing students, which GAGA does not serve. With that said, differentiation is a priority in order to accommodate the diverse students we serve in each GAGA class.

In order to address the first question regarding the qualitative and quantitative aspects of the GAGA course, I implemented a short preliminary test to gather data on any prior knowledge students had. Using this information helped me direct the lessons and place focus on contents that students struggled with. After the lesson, I assigned a post-test with similar questions from the pre-test to track their progress and growth. These questions are sometimes reworded or
flipped from the pre-test in order to reduce bias in the assessment process. As my co-teacher and I taught a particular concept, we disclosed the results as a class if students did well or did not do well to justify the amount of time needed to be spent for remediation of a particular concept.

In addition to preliminary and final tests, weekly quizzes with 10 multiple choice questions were evaluated on Fridays to identify which topics required remediation the following week. The weekly quizzes are reviewed with the students where answers are revealed, and students were afforded the opportunity to ask questions and gauge their own understanding. The post-test as mentioned before, has a total of 50 questions. Of those questions, many were aligned to address contents learned throughout the unit which were not initially assessed. These questions are more detailed and stem from previous questions on the pre-test and weekly quizzes.

Quantitative research is not enough since we recognize that some students perform better than others during tests or exams. In fact, some students experience anxiety which serves as an interference with their growth assessment. Diverse benchmarks were set in place to assess understanding through different learning outcomes in each thematic unit. These include written, verbal, and product assessment which are all reflected in the end of unit to measure metacognition.

To fairly assess student growth, whether it be a small percentage increase or a dramatic change in scores, self-regulation is imperative through reflecting. Numerical data is not the only proof of growth because self-acknowledgement matters as well. Likewise, unit reflections were given to gauge metacognition which helped students realize their strengths, weaknesses, gains, study habits, and thus improving their learning. In addition to reflecting on their progress, it should be noted that a reflection on the teacher’s delivery of the content may also interfere with
their ability to grasp the information in its entirety. It is through our student’s reflection that we were able to reflect on differentiation in order to create a better learning environment.

To address the second question, the end of each project concluded with a written reflection. The same reflection sheet was used for each unit to remain uniform and easy to analyze. Students were asked to reflect on their learning experience, work ethic, and opinion of the project. The reflection sheet also solicited suggestions to improve the project or GAGA class, GAGA integration, STEAM integration, and their work ethics. In regards to STEAM integration, I have put in tremendous effort to imbed interdisciplinary education of other discipline content aside from Geography. My co-teacher, Drew’s STEAM director, and I discussed project ideas and revised as needed to provide a unique and engaging projects that addressed all aspects of the STEAM approach. In doing so, we hoped that students become practitioners of STEAM education at DREW in the GAGA class. Because GAGA evolved from an introductory art course, the A in STEAM was naturally addressed. It was interesting to see how the rest of the STEAM unfolded and was received by our students in both GAGA classes. Only through their end of unit reflection was I truly able to know how well STEAM integration worked.

In order to address the third question, I kept personal notes of my experience in the GAGA class for each unit. Modifications were made when students expressed difficulty understanding a particular lesson. In a true project based learning environment (PBL), there is a focus on students, thus, their input is valuable and I must be flexible and willing to modify or even improvise my lesson plan very quickly. Because the course has two sections, it was interesting how I was influenced to make changes to the second section (3rd period) based on how the first section (2nd period) responded.
In addition to student commentary provided, I also provided my personal input on how planned lessons went and any changes that were made in the last chapter of this thesis. I realized perhaps a lesson that was great in concept and theory can be ineffective and unsuccessful for some students. On the contrary, data revealed that a lesson I thought may not be as interesting to some was actually loved by many students. I gained a lot of insights from each lesson that I planned with my co-teacher and the STEAM director. It helped me with future project ideas, daily lessons, and most important my teaching pedagogy.

3.2 IRB (Institutional Review Board)

Since this research includes human subjects—my students—I submitted an application to Georgia State’s Institutional Review Board (IRB). Because my high school students are under 18 years of age, parental consent must be on file and the student must also provide written consent to participate in the research. Both parent and student forms were distributed to address the purpose of the research, procedure, risk, benefits, compensation, voluntary participation and withdrawal, and confidentiality. Persons of contact (Dr. Davenport, Ms. Nguyen, and Susan Vogtner in GSU’s IRB office) were listed in case questions arose or clarification needed.

Once consent forms and assent forms were signed and returned to me, a copy of each was given to the parent and student for record keeping. Each student was given a pseudonym and/or code number that only I knew, safely stored on my password protected computer. The pseudonym protects the identity of each student in the case the individual student’s scores or reflection writing are used as supporting evidence in the research writing. A total of 22 students voluntarily provided necessary documents for this research study.

As mentioned previously, pre-test and post-test scores on specific questions were used to gather information on mastery of content. To eliminate memorization or bias the questions were
not identical in wording. Quiz grades were used to provide further supporting evidence and set the tone for post-test questions since pre-test consisted of 25 or less questions and post-test consisted of 50 questions. Reflection assignments were used as qualitative data to provide an understanding of the projects, quality of integration, STEAM, and overall learning experience. The reflection writing focused on the class rather than the teacher because it was used to help improve the GAGA course. Students were not asked a question directly through verbal procedures to avoid bias and uncomfortable feelings as a result of audio or visual recording. Students possessed the right to opt out of the research at any time without any risk or consequences before the paper was published.

An application to the IRB was made through GSU’s IRIS system in August 2017 and was approved in February 2018 after several revisions. The process required I, Ms. Nguyen, to fill out all necessary information and required documents prior to submitting it to the principal investigator, Melanie Davenport, and Department Chair, Michael White, for approval. Once approved by Dr. Davenport and Mr. White, the application was submitted to the IRB office for review. Once it was approved by the IRB, I was able to start data collection.

3.3 Timeline

The research was built upon my existing GAGA course, so all work was already in progress with the exception of the permission slips. The official start date of the GAGA course was July 31st although enrollment for the school year at Charles R. Drew Charter was July 26, 2017. The official end date involving student subjects was December 19, 2017 because it marks the end of the first semester. Work completed in the first semester was solely used for the research. The start of 2018 was used to compile data and complete all quantitative and qualitative analysis and writing. It is important to note that students were able to retract their participation at
any time throughout this period until May 2018, the conclusion. Additionally, any student who wished to submit a parental assent form and student consent form was able to do so until February 23, 2018 before the initial review submission to the Thesis committee in Spring 2018.

3.4 Data Collection

Data for this research were collected from regular class assignments. No additional work was required by participants, thus, non-participants also completed the same assignments. There were no risks or consequences for not participating, and work from non-participants was not included in the paper. It is important to note that non-participants’ pre-test and post-test scores were also not used as part of the class’ test average. In other words, the score did not reflect the entire GAGA class; it was only a reflection of students who voluntarily gave consent to the research.

Quantitative scores are provided in one section of this thesis and are organized by unit. The charts provide a breakdown of the quantitative data for each unit quizzes, pretest, and post-test in two parts: assessment average and question comparison. Meanwhile, qualitative data stemmed from student reflection. I hoped that students were honest in their reflection as I used both positive and negative comments to provide an accurate representation of personal opinion.

3.5 Authentic Student Feedback

Student feedback is imperative in the research since my student’s experience is a truer representation of the GAGA course than my assumptions about their experience based on my interaction with them. As an educator, I recognize there is going to be bias if I include my personal opinion of the course which I designed, and implemented,

Student input, whether positive or negative, will not impact their standing in my class as I am only interested in improving the course for years to come. I am currently in my sixth year of
teaching and acknowledge I am still developing in my professional career. Conducting research and reflecting upon the course will mature and enhance my role. I will not be able to reach my potential unless I take my students’ opinions into consideration to modify my lessons and/or teaching style.

3.6 Reflective Practice for Future GAGA PBL Implementation

In prior years, I have asked students to reflect on the projects and content assigned to them. I used their feedback to modify future projects and adjust timelines for certain mediums. Because the approach has helped me in the past, I have implemented it again this year and will adjust accordingly for the following school year. Because it is the first year working with an enduring theme rather than region-based lessons, it will be the first set of reflections I have acquired using this curriculum style. It will set the tone for next year’s curriculum as my co-teacher and I have planned to use the suggestions to create PBL while incorporating STEAM into our GAGA course for 2018-2019.
4 CURRICULUM INTEGRATION

In this chapter I provide analysis of the data collected on each unit of study that took place in the GAGA classroom from August – December 2017. These include a unit on Lanterns, Kites, Ceramic Burgers, and Mandalas, which can be found in their entirety in Appendices ABCD. For each unit, assessment averages from both class periods are concluded. These averages are weekly quizzes which in turn determined discussion, review, and preparation for the post-test. Student feedback for each unit are transcribed and multiple common ground are present.

4.1 Data Unit 1: Lantern

The first unit in GAGA introduced the fundamentals to both Art and Geography. For Art, students were exposed to the elements and principles of art. Fundamentals of Geography includes ESPN (economic, social, political, and environment) and MR.HELP (movement, region, human environmental interaction, economics, location, and place). Using these, students were asked to create a wearable lantern that can glow at night in hopes of participating in the annual night lantern festival in Atlanta. These lanterns creatively portrayed a destination of their choosing to highlight the different fundaments of Geography.

Figure 1 Student Work Representing New York
For Unit One, assessment includes a pre-test, weekly quizzes, and a post-test to track student progress and growth. It was expected students would not score high on the pre-test since lessons did not take place prior to implementing the pre-test. Quiz scores vary each week since content has been covered prior to any daily quizzes. The quizzes are used to remediate content the following week to ensure that students are retaining information and have a better understanding before taking the post-test. Workshops for remediation include small groups, class discussion, and additional content specific assignments.

Table 1 Unit 1 Pre-test and Post-test Average

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Pre-Test</th>
<th>Quiz 1</th>
<th>Quiz 2</th>
<th>Quiz 3</th>
<th>Quiz 4</th>
<th>Quiz 5</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>56.6%</td>
<td>77.8%</td>
<td>69.4%</td>
<td>69.5%</td>
<td>78.1%</td>
<td>73.5%</td>
<td>76.6%</td>
</tr>
</tbody>
</table>
Table 1 provides an average test score for each assessment between the 22 participants in this study in 2nd and 3rd period. Quiz one covered basic Art and Geography content, and I am pleased to see student growth in comparison to the pre-test score. Quizzes two and three dropped when a STEAM component, math and physics, were introduced in the lesson. It was the GAGA student’s first exposure to a rather in-depth lesson with another subject area in an attempt to bridge cross curricular learning. As a result of such foreign interdisciplinary connection in our GAGA class, the quiz average supported a need to make better connections in each classes.

The concepts of average speed, calculating average speed, and distance conversion in science and math were introduced simultaneously to the lantern production in GAGA. Despite the simultaneous learning, the test score indicated that additional review was necessary in order to support and make connections in their math and science class. It was not until I pulled students into small groups based on their weekly quiz performance for mathematics deficiency that I learned, not every student was taking a common math course. Some students were enrolled in geometry, thus conversion was not covered in their math class at the time. Although the majority of the students took algebra, there were a few students who took math support or algebra foundations. As a result of this, I learned there was a small number of students who did not experience the cross curricular learning we had originally planned.

Table 2 provides an in depth analysis in each content area and growth between pre-test, quizzes, and post-test. Content area includes Art, Geography, and STEAM components such as Engineering, Physics, and Algebra. For the data provided in Table 2, average speed calculation are grouped in the Physics content. Questions related to numerical conversions are assigned to Algebra. While the table below show learning curves in most areas from each content, it also
provides data on areas which need more attention and better delivery in the future. Multiple workshops were implemented to support student learning where needed on a daily basis.

Table 2 Unit 1 Summative Assessment Average Comparison

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percent of Students with Correct Answer</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Art</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elements of Art – Form, Line, Value, Color, Shape, Space, Texture</td>
<td>55.2%</td>
<td>81.8%</td>
<td></td>
</tr>
<tr>
<td>Principles of Art – Balance, Emphasis, Contrast, Rhythm, Unity, Movement, Pattern</td>
<td>N/A</td>
<td>85.7%</td>
<td></td>
</tr>
<tr>
<td>Art History</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative Process</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural Geography</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Map Skills</td>
<td>N/A</td>
<td></td>
<td>86.4%</td>
</tr>
<tr>
<td>Political Geography</td>
<td>N/A</td>
<td></td>
<td>91.84%</td>
</tr>
<tr>
<td>Physical Geography</td>
<td>N/A</td>
<td></td>
<td>84.1%</td>
</tr>
<tr>
<td>ESPN – Economic, Social, Political, and Environment</td>
<td>N/A</td>
<td>65.6%</td>
<td></td>
</tr>
<tr>
<td><strong>STEAM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science (Physics) – Average Speed Calculation</td>
<td>85%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Science (Physics) - Conceptual Average Speed</td>
<td>31%</td>
<td>27.3%</td>
<td></td>
</tr>
<tr>
<td>Math (Algebra) - Converting Units</td>
<td>23%</td>
<td>70.45%</td>
<td></td>
</tr>
</tbody>
</table>
4.1.1 Student Commentary Unit 1

For Unit One, students were able to articulate what they created and demonstrate how it relates to Geography, Art, and STEAM. Students were asked to create a custom wearable lantern representing a country of their choice, equipped with a ramp so that a ping pong ball, representative of a person, could travel through the glowing lantern (country). Student A8 concluded the “project challenges each student to research about a place they aren’t familiar with.” Students had to research the economic, social, political, and environment (ESPN) aspect of each country and creatively expressed this through an art form via a lantern. For example, A8 stated “I chose different colors and tribal markings to illustrate landmarks and locations consisted of shapes and lines.” A8 was able to see how interdisciplinary education took place in the GAGA classroom expressed “math and science was incorporated by how fast each ping pong ball went through the roller coaster of the lantern hat.” All students participating in this interdisciplinary project in the GAGA integrated classroom and maintained interesting perspectives on the project.

Figure 3 Student Work Representing United Kingdom
There was an overwhelming consensus that the project was creative and fun. Several students including A7 found the project to be so fun that he or she would do it again. A6 favored the project because it provided a chance for students to include LED lights which allowed the lantern hat to glow in the dark during the Atlanta Lantern Parade. Participants such as A2 shared an appreciation of freedom to choose a country of their choice for the project. Students learned a number of new facts regarding their chosen country economically, culturally, historically, among other aspects. More importantly, students such as B8 and A4 enjoyed learning about other countries through their peer’s unique presentation.

Though the project was a fun assignment, there were also challenges expressed by several students. Certain students felt there was a time constraint since the construction of the lantern required abundant amount of time per A9. One student, B9, pointed out that the original sketch seemed achievable but much more difficult during the production process, thus the design had to be modified. Although B9 did not voice her concerns in person, many students also had to reconstruct and edit certain parts of their design. Another challenge faced by many students was the construction of the ramp. A4 expressed frustration during the creation of the ramp because it wrapped around or inside each student’s lantern in order for the ping pong ball to travel.

Students also gave input on what improvements can be made moving forward in the GAGA classroom. There were a mixture of feelings in regards to the integration of Art and Geography. Some students, including A3 and A9, felt that art lessons took up too much time and wanted more Geography content to balance the class. A8 provided valuable information by expressing concerns with research skills. This participant wanted more guidance and emphasis on the research process rather than the art production since the research is the foundation of a good product. On the contrary, B6 and B9 felt there was not enough art in the unit. Though A9
felt that art took up too much time, he or she also felt a lack of art material was incorporated other than creating a lantern. Artistic ability was a concern for B6 who expressed not being very artistic and had hoped for more technical skills to be utilized.

4.1.2 Student Sample Unit 1

Figure 1 is symbolic of New York and can be recognized by the Statue of Liberty’s crown. Due to the laborious structural design, this student opted for a simple red ramp on the side of the crown. Figure 2 depicts the Eiffel Tower with several purposeful design additions to show ESPN research for this project. For example, the flag represented a political aspect and the yellow coin symbolizes the economy and history of France. One student took on the challenge of designing a lantern which presented London by depicting the iconic red telephone booth. The top of the booth is adorn with a yellow crown to symbolize a monarchy in the governing system. An in-progress photograph, Figure 4, shows a student building the framework before tissue was placed on top, revealing the design students had in mind.

Figure 4 Lantern Structure Progress
4.2 Data Unit 2: Kite

Unit Two incorporated physical geography and mark making techniques to create a tetrahedral kite. This unit heavily embedded math (area and surface area) and science (force). The geometric units (tetrahedrons) are made by individual students and collectively, these units create a single tetrahedral kite. The shape of the kite is shaped like a mountain, one type of physical feature, which can be seen in Figure 5. Through this project students learned how physical features and climate affect population settlement through verbal and written communication. Figure 6 displays student samples of physical features, which utilizes hatching, cross hatching, and stippling.

Figure 5 2nd and 3rd period Tetrahedral Kite
For Unit Two, a pre-test was not given prior to starting the unit. Instead, weekly quizzes were given to assist with remediation. As mentioned before, my goal for all summative assessments is to score at least a 70% to show mastery of content. A thorough breakdown of content are categorized and can be found in Table 3.

A closer examination of Table 3 supports an increase in mastery of art history content after remediation with a 28.8% growth. I am pleased to see students were able to learn and retain content concerning origins of kite, kite traditions, and physical characteristic of kites
from various countries. In addition, I am satisfied to see gains in Geometry as students worked with area and surface area connected to the tetrahedral kite that were made.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Art</strong></td>
<td></td>
</tr>
<tr>
<td>Technique</td>
<td>93.7%</td>
</tr>
<tr>
<td>Art History</td>
<td>93.7%</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td></td>
</tr>
<tr>
<td>Land Use and Resources</td>
<td>79%</td>
</tr>
<tr>
<td>Push and Pull Factors</td>
<td>98.5%</td>
</tr>
<tr>
<td>Population</td>
<td>62.9%</td>
</tr>
<tr>
<td>Geography- Climate Zones</td>
<td>76.25%</td>
</tr>
<tr>
<td><strong>STEAM</strong></td>
<td></td>
</tr>
<tr>
<td>Math (Geometry)</td>
<td>75.9%</td>
</tr>
<tr>
<td>Science (Physics)</td>
<td>75.3%</td>
</tr>
</tbody>
</table>

**4.2.1 Student Commentary Unit 2**

For Unit Two, all students were able to articulate what was created for the project and how Art and Geography were addressed. Participant A7 was able to clearly state she took part in creating “two tetrahedral kite which represented a physical feature and climate.” Another participant, A8, clarified that she “created a tetrahedron, which was later attached to others and became a tetrahedral kite”. A8 further explained one kite “was created to illustrate the impact of physical characteristics on human settlement” while the other illustrated the effects climate have on human settlement.

Unit Two was received with many positive feedbacks for creativity. While students enjoyed the project, there was also frustrated expressed. Some students expressed hardship in
research as mentioned before in Unit One. Participants such as A9 and A8 suggested more scaffolding with research skills and perhaps providing more materials in class to reduce research. Because the project used materials that were quite thin like tissue paper, B1 and long other students expressed frustration writing geographic information and using marking making techniques to illustrate their physical feature. Extra attention was required to prevent from ripping the tissue paper for each hatching stokes made with an ultra-fine sharpie marker as seen on Figure 9. Students like A5 felt discouraged in completing the project because the creative process required practice by sketching numerous times before creating a final drawing. Patience was important to students as they were not allowed to start on the final project until they improved in mastering the marking making techniques. Another group of students such as A6 and A13 was disheartened to see their designs disappear when alcohol solution was sprayed over the sharpie in an attempt to create an abstract art symbolizing climate. Despite being warned that the colors will mix to create a fluid symbolism of climate, some students could not believe how powerful the sharpie reacted to the alcohol.

Two major science connections were intended for the project. The first was for students to witness how a dry compound reacts as it is dissolved in liquid. In this case, because sharpies are alcohol based ink, only liquid alcohol can cause it to react. I am content because students such as B8 realized how physics concepts such as weight, lift, drag, and tension contributed to kite flying. Students also reviewed how the Pythagorean Theorem was used in the GAGA class to determine the height of triangles in the tetrahedron or the tetrahedral kite as a whole. Students found the engineering process of the tetrahedral kite very interesting and how the structure was able to remain soaring in the air.
Similar to Unit One, several students felt that Art overpowered Geography and hope to receive more Geography content in future (B6, A8). Some students wanted the geography to be made more clear on the kite. On the other hand, there were also students such as B9 who expressed “art didn’t really have a good cohesive part because it was a small portion such as drawing which had no big meaning.”

When asked to redesign the unit about physical geography, a variety of ideas were suggested. A7 suggested creating a “sculpture of things that surround a physical feature but only use colors of its climate.” Another participant, A8, suggested “creating a 3D map that has concentrations of stippling to represent settlement and discuss why.” I was astonished to see one particular student, A13, suggested a project idea which was actually planned for second semester: “I would visually depict population settlement by drawing the country and using one color with draw color dark for more populated parts and lighter for less populated areas.” Although this unit explained impacts on settlement, many students thought the unit was on population. The project’s theme concentrated on physical geography and how physical features and climate affected population.

4.2.2 Student Sample Unit 2

To provide a preview into how interdisciplinary plays a role in the GAGA class, Figure 7 shows two students working on the math component of the kite project. Students worked on several different scaled triangles to calculate area and surface area. To stress the design process of engineering in GAGA, students created prototypes which provided a visual reference of what the kite will look like when constructed (Figure 8). Through this prototype, students quickly found that a very tight knot must be made in order for the kite to stay in tact during ascension. The art production which required students to illustrate physical features using mark
making techniques can be seen in Figure 9. A closer look at some student work can be found in Figure 6. After completing the art component, Figure 10 shows one student adding her tetrahedron to the class’s tetrahedral kite. A scale of the tetrahedral kites made by both periods can be seen in Figure 5.
Figure 8 Tetrahedral Kite Prototype

Figure 9 Kite Production in Progress
4.3 Data Unit 3: Ceramic Burger

Unit Three highlights ceramic art and cultural geography. Culture is very broad and allowed various project ideas to come about such as a ceramic burger. This project provided students to be very creatively not only through art production but through recipe creation. Student worked in groups and made a recipe to illustrate how diet is affected by one’s culture emphasizing location and religion.
Assessments in Unit Three are similar to Unit Two in that there are no pre-test given. Only summative assessment average from the unit post-test are provided which can be found in Table 4. For the art content, the biggest growth seen was in stages and processes of ceramics though quiz data are not shown for comparison. The summative assessment provided 80.8% of students were able to distinguished green ware, bisque ware, and glaze ware apart from one another. In addition, 88.5% of students were able to identify the chemical and physical changes that takes place during particular ceramic stages. For some students, it was their first time working and learning about ceramics which made it very rewarding to see quantitative data that supports how much they have learned.

Overall, the scores indicated that students completed this unit with a better understanding on cultural geography and ceramics.

A review from Unit Two was included in the post-test to further collect data on several topics: Population, Land use, Push and Pull Factor, Zones. Comparing data from Table 3 and Table 4 suggested students gained more understanding after the post-test in Unit Two was discussed and reviewed. In addition, some of the material learned in Unit Two was further
elaborated during Unit Three whenever a connection could be found between the two units of study

Table 4 Unit 3 Summative Assessment Average

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Post-test Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Art</strong></td>
<td></td>
</tr>
<tr>
<td>Stages and Processes</td>
<td>80.8%</td>
</tr>
<tr>
<td>Tools and Techniques</td>
<td>93.9%</td>
</tr>
<tr>
<td>Safety and Procedures</td>
<td>90.6%</td>
</tr>
<tr>
<td>Elements and Principles of Art</td>
<td>92.1%</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td>78.2%</td>
</tr>
<tr>
<td>Ethnic and Race</td>
<td>78.2%</td>
</tr>
<tr>
<td>Cultural Impact</td>
<td>91.8%</td>
</tr>
<tr>
<td>Unit 2 Review – Population, Land use, Push and Pull Factor, Zones.</td>
<td>86.15%</td>
</tr>
<tr>
<td><strong>STEAM</strong></td>
<td></td>
</tr>
<tr>
<td>Science (Chemistry)</td>
<td>88.5%</td>
</tr>
</tbody>
</table>

4.3.1 Student Commentary Unit 3

Students loved the burger project for Unit Two, Cultural Geography. Students worked in groups and each created a ceramic burger using knowledge about each country, Figure11 and its culture and traditions per A13. A2 expressed how much fun and educational the project was. The project provided a different experience by working with clay and allowed students to use “knowledge, creativity, and imagination to create an original burger” (A2). As mentioned before, it was a first time experience for students like A5 and left a positive impact on them while enrolled in GAGA.
Students were able to witness the physical changes and chemical changes (A4). In terms of chemical changes, students saw the physical changes in the sub stages of green ware: leather hard and bone dry. Students saw a chemical change from green ware to bisque ware since physical changes could no longer be made. The most impactful visual of chemical change witnessed was the transition from bisque ware to glaze ware. Students were very excited to see how the colors and layers applied to their burger.

Challenges shared by students comprised of one common topic: group work. There were mixed feeling about group work. For example, A13 expressed concerns about different opinions causing difficulty with another participant. A9, liked the exposure different opinions brought to the creation of their burger. It was unanimous upon the benefits of group work includes the reduction of workload. Another advantage A3 states, was improved social skills which may have otherwise not developed under independent projects. Each group member was chosen by teachers, therefore students had to interact and practice how to speak and respond to peers.

Suggestions and project ideas provided by students varied greatly. A13 proposed “designing and creating an outfit based on cultural landscapes.” Another student, A9, wanted to use language as the main topic to produce a 3D object. This particular student also recommends students should be able to choose their own country rather than be given a country to research. A2 emphasized choice for projects as well by allowing students to include a country’s culture such as food, clothing, and religion. A13 recommended using more sound and video art to educate others on cultural geography of a particular place. Hoping to increase interaction in art projects, B5 proposed developing a board game which would allow people to learn and play about a country’s culture.
4.3.2 Student Sample Unit 3

Two student samples are shown below including a Brazilian and Japanese burger. Many students enjoyed working on the project which kept classroom management under control. Students focusing attention on each ingredient on their burger recipe from the production process to the glazing process. Figure 12 displays two students from the same group working on their individual burgers. Individual burgers from each group were required to look similar with the same ingredients. It was a great collaborative project as students had the opportunity to assemble an idea and help one another to mold it into a certain ingredient.

Figure 12 Green Ware Stage Production
An example of a Brazilian burger, Figure 13, created by A7 utilized beef and pork, coconut shavings or the white area above the green lettuce and bean sauce. This student researched burgers created in Brazil and common ingredients used in this country. It resulted in a very unique burger ingredient which will surely surprise everyone’s tastebud!

Another example created by A13, Figure 11, displays a Japanese burger consisting of wasabi ketchup, mocha balls, seaweed, beef patty, soy sauce, and topped with a pink sakura bun. Extensive research was done in order to create this one of a kind burger inspired by KFC’s pink burger. This burger took into account the diet, location, and pop culture of Japan and agreed upon as a group prior to submitting their sketches.

4.4 Data Unit 4: Mandala

Political Geography was the theme for Unit Four. One particular standard was emphasized in this unit: non-government organization (NGO). This topic was paired with digital art to create
a mandala to symbolize peace, an effort made by the majority of all NGO selected. This project marked the end of semester one, thus there was an emphasis on independent researched. A research guide was provided since several students brought up concerns with research skills. Through their research students had to use their visual literacy skills to filter information and embed symbolic meaning of their NGO. Two examples are provided below for visual references. More examples can be found at the end of section 4.4.

Figure 14 Student Work Representing Human Rights Watch
For this unit, student was only quizzed once and this was used as data comparison with the Post-test. The post-test for Unit Four is unique in that it was a midterm and consisted of questions covering content since the August. As always, a study guide was given and any content covered from August to December had equal chances of being on the post-test, Unit Four Midterm. Because of this, some quizzes or pre-test scores are pulled from previous unit’s post-test score as comparison. With such a broad range of themes, topics, and content, we anticipated a slight dip on some post-test scores compared to the quiz or pre-test score.

Data from Table 5 provides the summative midterm average learned since the beginning of semester one. A closer examination of the post-test score from Table 2 compared to Table 5 provided a steady mastery of content in the elements of art and principles of art with both ranging in the 80’s. For a mid-term assessment that covers different art history from each unit
studied, I was satisfied that students had an average of 81.2%. Tools and technique continued to show student growth with a 95.7% which was more than what I could have imagined. I was disappointed to see a decrease in stages and procedures but students still score above a 70%, which was the lowest score goal I set.

Table 5 Unit 4 Summative Midterm Average

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Midterm Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Art</strong></td>
<td></td>
</tr>
<tr>
<td>Elements of Art</td>
<td>81.2%</td>
</tr>
<tr>
<td>Principles of Art</td>
<td>83.7%</td>
</tr>
<tr>
<td>Art History</td>
<td>81.2%</td>
</tr>
<tr>
<td>Tools and Technique</td>
<td>95.7%</td>
</tr>
<tr>
<td>Stages and Procedures</td>
<td>72.9%</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td></td>
</tr>
<tr>
<td>Physical Feature</td>
<td>N/A</td>
</tr>
<tr>
<td>Political</td>
<td>N/A</td>
</tr>
<tr>
<td>Land Use and Resources</td>
<td>91.6%</td>
</tr>
<tr>
<td>Push and Pull Factors</td>
<td>90.6%</td>
</tr>
<tr>
<td>Population</td>
<td>44.7%</td>
</tr>
<tr>
<td>Culture</td>
<td>81.4%</td>
</tr>
<tr>
<td>Cultural Impact</td>
<td>93.7%</td>
</tr>
<tr>
<td>Regions and Climate Zones</td>
<td>77.6%</td>
</tr>
<tr>
<td><strong>STEAM</strong></td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>63.55%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>84.1%</td>
</tr>
</tbody>
</table>
In terms of Geography, students had an overall good score for each topic except population. It seemed that students struggled with population which is associated with physical feature in Unit Two. Because the theme of population itself is not covered until second semester, the Geography teacher and I planned and placed more emphasis on population content to ensure students have a better understanding. Physics concept proved to be a struggle for my 9th grade students, and more of my personal reflection regarding this will be included in Chapter Five.

4.4.1 Student Commentary Unit 4

For this project students made a mandala to represent a Non-Profit Organization (NGO) related to the theme of Political Geography (B8). Students learned how mandalas bring peace, traditional practices, and how it relates back to religion. Through their research, students learned interesting facts about their NGO and how the organization’s effort have an impact on the community and world (A2). Students must transform facts about political organizations into a visual symbolic mandala to depict how the organization plays a role in creating peace through social or political justice.

A large majority of students, if not all, loved this project. Most students liked using technology to create their designs because it was a unique experience for them in the art classroom (A6). Because the program to use was open source, some students created additional pieces on their personal time because it was so intriguing to see different images formed when mirrored to create the mandala (A2). A4 felt incorporating technology in the mandala project saved a lot of time since it was easy to start over or refine the design on a computer. Had it been pencil and paper, it would have taken a much longer time to complete. In addition, practicing digital art provided a different avenue for some students to show off their art skills outside of
drawing and painting (A9). Meanwhile, A7 expressed that technology “took away the challenge and beauty of mandalas.”

Students were able to see how math played a role the mandala project. B4 stated everyone’s mandala was a different shape which was a part of geometry. Another participant, A13, further elaborated on the geometry aspect by explaining the importance of degrees to get a particular geometric shape. Though the creation of the mandala was created using technology, students were still exposed to traditional handmade methods and the importance of math in this process. Some students like A4 expressed the challenges of the math concept and equations.

Students shared their thoughts on the integration of Art and Geography and opinions varied. Student B4 saw how the mandala related to Art and Geography but felt that it could have been pushed more. This participant along with A9 wanted to learn more about political geography beyond government organizations. There are also some students, B7 and B3, who enjoyed the art process very much and did not see how geography played a role in the mandala. Meanwhile, there were a handful of students who expressed “I think it connected art to geography well because it made a healthy connection between the two by using art to represent an organization” (A7).

Suggestions provided by students includes having the choice to choose any NGO that interest them rather than choosing from a list that we provide. Another student, B7, enjoyed making the mandala but suggest giving students the choice to choose the theme or topic rather than an NGO. A7 was very intrigued by the art history content of mandalas and suggest letting students create a traditional one using sand like the Tibetan monks. One student, A2, redesigned the unit project by proposing a poster size puzzle to learn about borders and political facts within
each state or country. This is an interesting idea and addresses a standard of political geography, borders.

4.4.2 Student Sample Unit 4

Sample mandala projects provided are created by individual students embedded with meaning and symbols that tie back into a specific NGO. An artist statement written by each student is not provided but are summarized in this section to provide artistic decision to express meaning in the design process. I have chosen two student samples, Figure 16 and Figure 17, to give a brief explanation of their work. Other student samples are provided with the organization’s name as the title and can be further researched at your own discretion.

Figure 16 Student Work Representing Barefoot College
Figure 16 represents Barefoot College and utilized the gender symbol and a flower motif to express the organization’s focus on females. This student also chose to use a warm color scheme in order to express happiness, gratitude, and a positive energy. Chai is an organization providing help to people who suffer from HIV/AIDS in developing countries as presented in Figure 17. The design of Figure 17 is filled with red ribbons on the outer edge to represent the 37.6 million people who suffer from HIV/AIDS. A yellow star burst from the center is representative of the Chai logo.

Figure 17 Student Work Representing Chai
Figure 18 Student Work Representing Architecture for Humanity

Figure 19 Student Work Representing Transparency International
5 CONCLUSIONS

In this chapter I reflect on the three questions that guided my initial research:

1. Is the GAGA curriculum effective or ineffective in terms of learning achievement for students in the two disciplines?

2. What can I learn from student input to assist in the development of curriculum-based learning in the future?

3. How does self-reflection assist me in making the course even better?

5.1 GAGA Curriculum Reflection

In addressing the first question, I primarily used quantitative data presented in the tables found in Chapter Four, along with pertinent qualitative data. With regards to Art, the post-test data was above 70% in all categories except one. Though there was a slight increase in art history, Unit One, from 62.15% to 63.9%, this data was not sufficient to support achievement. Having looked closely at categorized test scores on a regular basis, I reflected on this and placed more emphasis on the art history portion of Unit Two. This self-reflective process proved worthwhile in Unit Two with test scores showing an increase from 64.9% to 93.7%. Reflections and implications of art history is provided in section 5.1.

Similar reflection applies to Geography with an overall positive feedback from test scores except on ESPN, population, and culture. These three areas are very diverse and hence, there was a slight decrease in student performance. Of the three categories, only population scored below a 70%. Given this data, more emphasis is needed to be placed on this topic by the Geography teacher in the future. This could be addressed by reducing class time spent on art production, as suggested in some student feedback. There were several students who suggested the art
production took up the majority of the time and should be scaled back to balance Geography in class.

Overall, the data supports student growth in all content areas taught by GAGA except science. Science was the area that needed the most improvement as indicated in Table 2 and Table 4. A reflection and implication regarding science content is provided in section 5.4 and 5.3. Aside from science, it is great to see student growth in Art, Geography, Algebra, and Geometry. Having relived my experience of math content during my own lesson planning, I am content to see hard work paid off with improved scores on post-tests.

5.2 Student Input to Drive Future Planning

In addressing the second research question, I have analyzed my students’ unit reflections and addressed it in each sub-unit of this chapter. A brief summary of their reflection includes wider emphasis on Geography instead of Art, as mentioned in the previous section, and greater student autonomy.

Reflecting on student comments, I have concluded that more attention needs to be placed on Geography. In addition, to alleviate the feeling that Art overpowers Geography, the two disciplines should rotate every other day rather than placing all production at the end of each unit. I believe that because art production takes place last after content is taught, students are left with an impression that much of class is art based.

The majority of students really enjoy the projects created in class and thought that it should be kept the same. Many students expressed seeing how Art and Geography were addressed in each project with some elaborating how one discipline may need additional work. The majority of students appreciated working in groups, but suggested drawbacks as well as benefits to group work. It can be said that students encourage additional group work to improve
their social and collaborative abilities. In addition, students seem to appreciate autonomy and a decrease in teacher prescriptions especially with project theme. In the future, I plan to provide a number of themes or topics that students can select to compromise with teacher-student autonomy in the class. More on student autonomy can be found in section 5.4.

5.3 Self-Reflection to Improve Practice

To answer the third research question, there are many things that I can do to improve the GAGA course. Prior to beginning, I would like to say that interdisciplinary education is challenging but definitely worthwhile. Going through the process of re-learning and teaching content beyond my expertise is daunting. I have to be well prepared to answer questions and provide sufficient scaffolding so that students don’t feel lost. Science definitely proved to be a struggle for me and my data suggests that I need to improve my teaching in this content area. In addition, I saw the confusion on my students face as we experienced physics and chemistry together. I believe that I need to seek more assistance with science if I were to apply it in my future classes.

Although I felt that students actually needed more time to work on their art project since time management is a skill that a number of my students find challenging. Personally, I plan to implement the same or even more art production time allotted in each unit in addition to providing more time for Geography by extending each unit by a few days. This will require that my co-teacher and I reorganize our units to accommodate for this change. For the time being, there are four units in semester one and three units in semester two, and shuffling these units around is also a possibility for future improvement.

Making changes to any integrated course requires two in the decision process, hence co-teaching is heavily embedded with a strong relationship. During the past four years of teaching
this program, I feel that the bond I have built with each teacher becomes stronger as I get accustomed to sharing the classroom. Once the curriculum map has been set, we naturally read each other’s mind and are inviting to new ideas, teaching strategies, technology, and even last minute changes that need to be made. This kind of relationship often intrudes into each other’s personal time outside of school, but is worthwhile since our end goal is to better serve all of our students. Through my personal experience, the best relationships evolve when risks are taken and challenges are accepted to include interdisciplinary education. I am a firm believer that teaching is a process of learning through research and in that learning process, the connections made are the most rewarding. Sometimes, these connection can’t be made alone, and requires dialogue with someone else in order to stimulate incredible ideas.

There are other areas that I need work on but more of this can be found in the writing to follow. The remainder of this chapter provides reflections and implications for each unit that took place from August – December 2017 in the GAGA course. Each unit of study detailed experiences contributing to my growth as a professional. I dealt with unforeseen obstacles and had to improvise in order for the class to transition smoothly. It was interesting to see how my assumptions of student learning differs from reality as I assisted students one on one, versus reading their individual unit reflections. My students’ reflections provided me with valuable information I otherwise may not have taken into consideration from a teacher’s standpoint.

5.4 Lantern Project Unit 1 Implications

I was able to see the importance of providing options to my students. The opportunity to have a voice in their decision making enables countless possibilities for creativity, expression, and allows students to take ownership of their work. The lantern project was flexible and had unlimited ideas which is why it turned out very well. On the other hand, there are certain projects
where student opinions requires limitation in order to better manage expectation, learning, and content.

Research skills are acquired over time and requires practice and scaffolding. Due to student concerns with research skills, I believe it is up to the educator to provide guidance to improve and enhance those abilities. As I progressed from one unit to another, I took suggestions into consideration by incorporating project guides which assisted students in their research initially and the necessary steps to complete it. In the future, I plan to make small workshops available so that students can voluntarily attend during class time to work on their research skills. For some students, I may have to make it a requirement in case they mistakenly feel as though they may not need assistance. Because greater emphasis on research ability will result in less time for production, it required me to modify certain aspects of the project (i.e. procedure or methods) in order to allow sufficient time for production.

If I were to implement the project again, I would seek the Physics instructor’s assistance more often. Prior to and during the project, I met with my Physics counterpart twice to review the physics concept I wanted to pursue and how to teach it. Despite our meetings, the data does not support student growth in Physics concept and speed calculation. Unfortunately, speed calculation only took place in the GAGA classroom because only basic concepts were taught in their immediate physics course. Students were familiar and able to calculate one single trip but struggled with round trip calculation. It is quite possible that I needed to improve my overall lesson delivery, or perhaps even reword the questions given on their assessment in a different or better format. Using the quiz grades, I identify students who needed additional help and provided small group review, which did help some students but not others. It was during this point when I realized some of the struggling students were enrolled in foundations to algebra, thus it was not
as simple for them to solve as I had thought. Having spoken with the Algebra teacher about aligning our courses, we were able to achieve a schedule to work on conversions in both classes simultaneously. The collaboration contributed to data which supported student growth.

I realized that students were very attached to their calculators. Math education today versus a decade ago is much different due to the availability of technology and advancement of calculators. For example, with smart phones serving as multi-functional devices, students relied heavily on them for their mathematical capabilities. Mental math had to be emphasized on students as the simple calculations were not difficult or time consuming. It took time for students to adapt to this new (or rather old) method of working with basic writing utensils, rather than continuing to rely on their calculators or other digital devices. The underlying motive into prohibiting students from using these devices was not only to evaluate their aptitude in math, but also to better prepare them for the ‘no calculator’ section of the Milestones. I learned very quickly that doing division by hand was a struggle for students. Verbal and written performance for math did not translate well and it required several small groups to ensure students become proficient.

The data suggests there are several improvements I could make to grow as an educator in order to benefit my students and help them grow as well. Firstly, there was barely any increase in the art history of the lantern. I realize I should be reviewing historical content with my students in greater detail and perhaps implement a written assignment to identify selected individuals who may need remediation. I could also create a game which will allow students to interact in groups so that they can learn from each another. Doing so can make education fun, sociable, and provide instant constructive feedback. As previously mentioned, improving my delivery of Physics is also a necessity. I should focus solely on single trip word problems rather than including round
trip calculations as seen in Appendix B.1. Though the data does not break it down in detail, my interaction among students within the classroom provided me with such insight.

5.5 Kite Unit 2 Implications

The kite project was the most difficult one for students to grasp. To begin, students expressed discontent with science and math interdisciplinary learning in the classroom even though they saw the connection. They felt that the class and project itself already had two subjects, Art and Geography, and did not need to be overwhelmed with other content areas. It could be that students are not used to being actively engaged in multiple other academics in their previous classes, or it was never clearly pointed out where subjects can cross paths with one another. Their comments also suggest that I need to scale back on interdisciplinary learning during their first two months of high school.

Interdisciplinary education took place through the teaching of Physics concept and math calculations. Area and surface area were taught in middle school but it took two class periods to review this concept and how it relates to the Tetrahedral Kite. After the first day of focusing on math, we thought it may be more helpful to have students teach their peers as they stood in front
of class and became one of us, teachers. *Figure 20* illustrates one student who felt comfortable with the math content and acted as a teacher by solving problems, asking questions, and verbally

![Figure 20 Peer Teaching](image)

explained his math process. I felt that having students teach their peers, they were able to connect and learn interactively and more efficiently than I had done with them on day one. In the future, I definitely plan to have more peer-teachers for any content that students seem to struggle with, particularly with content outside of my field or specialty. Moreover, I was able to walk around to identify and answer questions that students had much quicker than when I was up front teaching.

Selection of materials was not received very well by students. There were a few students who worked too fast or drew too hard with the sharpie and ripped their tissue paper. However, this was not a large concern since clear tape was readily available to remedy the problem. The main issue that students had was how the material slowed down their progress since extra
Attention and time was required whilst drawing on tissue paper. Students did understand why tissue paper was needed – weight affected aerodynamics of the kite. Students also used plastic bags but did not like the elasticity of the bag either. The majority if not all student preferred the tissue paper over the plastic bag. When asked if there were any other lightweight materials that we can use for the project, students were not able to propose one. Likewise, I hope to experiment with more materials that are lightweight and test it out before implementing this project again.

Although students posed no questions about different forms for the kite, I would like to have my next class experiment with this option. Rather than a tetrahedral, can any other polygon allow the kite to maintain or even be more aerodynamically sound? What shape best supports the function of a kite? In doing so, students will also have to take ownership of their learning as they solve for area and surface area to obtain enough materials to cover the kite. In addition, rather than providing all the materials to students up front, perhaps having the students research and select materials they think might perform the best would be a better idea moving forward.

Concepts in Physics continued to be a lingering struggle for students. Although data showed student growth, there was little increase. The concept of kite aerodynamics was confusing for students and I could have done a better job putting students into small groups to check for comprehension. I also could have presented students with a short video clip to visually show how weight, gravity, lift, and drag each have an effect on kite aerodynamics. Also, we were never able to test the kites as a class due to inclement weather. It was extremely cold and almost zero wind during the timeframe set aside for testing. Luckily, I was able to test the prototype and final kite myself during an outside session which had a fair amount of wind to create enough lift for my kite. I did take both class’ tetrahedral kites to participate in the Atlanta Kite Festival where outside temperatures were frigid to say the least. Additionally, it had rained
the day before, and that also had an effect on the kites made out of tissue paper. Although it was cold, the day was also windy and allowed me to test out the kite. A few of my students even made it out to the kite festival and saw our kite take flight in the sky. The largest kite I had consisted of roughly 35 tetrahedrons, but it was still considerably light. Despite being light, it required strong winds. At one point, a gust of wind snapped one of the kites and it tumbled across the field at Piedmont Park. Luckily, it did not go too far due to its tetrahedral shape. I received quite a few compliments regarding uniqueness, artwork, and functionality of the kite. I plan to do this project again but will use another theme or topic, rather than physical geography.

As suggested by many students, art production took up the majority of this unit. Likewise, I can see how student felt Art overpowered Geography and suggested more social studies content be taught next time. The data provided in Table 3 supports their concern since the assessment also indicates more time needed to be spent on teaching content rather than build. In the future, my co-teacher and I will need to balance both content so that students do not feel one overpowers another. On the other hand, I was satisfied to see a 28.8% increase in art history over the course of this unit. It is also rewarding to see that students still maintain the elements and principles of art even though it was not taught as a priority for this unit.

Overall, I think students felt this project had too much interdisciplinary and was overwhelmed. Some students did not finished their tetrahedron in time to contribute to the final tetrahedral kite. I think the kite project may be better implemented as a beginning project to learn about the elements and principles of design. I also think this project would fit great to in a Physics or Geometry class. Because of the interdisciplinary that occurred in this unit, I went through a learning process as well. I had to review the information prior to teaching my students and it was a humbling experience. The educational experience that math and science provided,
along with lesson planning for the GAGA class were cumbersome but completely worth it. I struggled through my learning experience and used that to simplify the process to avoid similar conflicts for my students.

### 5.6 Burger and Cultures Unit 3 Implications

Cultural geography had a lot to offer and we decided to focus on how religion and location affects diet. It was great seeing my students look forward to a ceramics project. For some students, it was their favorite project because it was a new material which they had never worked with. For others, they loved the project because it was very hands on and tactile. Additionally, some student had a positive outlook and confidence going into this project because it didn’t require the same technical drawing skills which caused some students anxiety. Building requires a different set of skills and many students impressed me with their quality of work.

I am very content with the data for stages and process of ceramics. Again, this was some student’s first encounter with clay and ceramics content. Therefore, this new information may be confusing for them to internalize. With an 80.8% average on the post-test, this learning curve supports student growth considering the different stages of ceramics students were required to know (*Table 4*). Another set of data that I am satisfied with are tools and techniques. I contribute the success of tools and techniques to having the privilege to provide every table with an adequate set of tools to use in the making of their burger. Drew had a budget that allowed me to provide ceramic tools rather than supplemental tools for specific functions. For that, I am very grateful that my students had the opportunity to experience what each tool offered rather than just learning through verbal, visual, or auditory instructional strategies.

Based on student feedback, they enjoyed working in groups. Group work allowed students to learn from one another easily in the event I was occupied helping other students.
Students can check one another’s work and developed social skills as mentioned by several students. By being inter-dependent of one another, students built relationships and trust. By allowing different opinions to be shared, students were exposed to multiple ideas and learned how to compromise. On the contrary, there are a few instances where extreme ideas were presented and it was very hard for particular groups to settle on a final decision. It is through these experiences that students can acquire skills to better handle opposing ideas different from their own. Personally, I liked the group project as it made content management easier and more accurate.

Students expressed discontent when the project was restricted to six different countries. Since students had complete freedom for their lanterns in a previous unit, this may have been a leading factor for additional suggestions offered. Because it took so long for us to grade for accuracy in their lantern project, we learned from that experience and was adamant in limiting choices for this project. We selected a country from each continent except for North America to provide variety. Unfortunately, this variety was not enough for my students, and I am conflicted between our opposing views. Perhaps in the future, I will allow smaller classes to have freedom of choice, but larger classes will have to be limited. Freedom of choice allows for creativity but I also have to be aware of how much workload I am personally able to take on. Even with limiting the choices, I was surprised to see the differences in burger recipes for the same country just between class periods. I also had my intermediate ceramics class work on this project and the recipes created differ drastically. It was delightful to see interesting ingredients in recipe, and I would love to have these ideas come to fruition by making real burgers. Unfortunately, time and other constraints did not allow for any classes to turn their ideas into reality.
Students gave interesting alternative projects for the cultural geography unit. I like the idea of having students create a movie or music video allowing students a chance to work on performance art. As suggested, students will include cultural content learned in class and through research such as religion, food, location, clothes, language, landforms, climate, etc. Taking their idea to the next level, I would have students include a visual arts content with digital art by making a movie or music video poster. Students will be exposed to a variety of fine arts through this suggested project.

5.7 NGO Mandalas Unit 4 Implications

Initially, this project was supposed to have students design a cover for a game, PeaceMaker. Due to a subscription issue, this project was changed into a mandala project but we still kept the unit on political geography and digital art. With the sudden change in project idea, we did not feel confident that acceptability amongst students would be very high. Surprisingly, the students really enjoyed this project and even created more than what was asked of them.

There were a few students who suggested providing freedom of topic and theme. Due to the current unit of study, political geography, we were unable to do so. However, this project can be modified very easily to allow for choice and creativity in a traditional art class or another flexible unit of study. I look forward to seeing unique designs emerge in a future unit of study or class.

One student provided a suggestion that I had been wanting to do for years. The student proposed creating mandalas in the tradition of Tibetan Monks. Because of the ephemeral nature and space limitation, I have not been able to do this as a class project. However, I have purchased colored sand and hope to carry out this idea during International Day this year at Drew
Charter. This traditional practice can be experienced by everyone who attends International Day by taking part in a large collaborative mandala designed on site.

The data for this unit provides assessment results from all content studied since August – December 2018. Because the post-test, midterm, covered such a wide range of information, the results were not we had hoped for but was expected. The current unit of study data ranged in the low 80’s, which displays good standing. I was disheartened to see reviewed information for stages and procedures in the previous unit plummet by 7.9% between Table 4 and Table 5. Geography content covered a great deal of information and could have been reviewed in a better manner.

Again, students expressed that art seem to overpower Geography in the creation of the mandala. I believe this was because content is always taught first followed by art production, which leaves students with a better lasting memory of what was done last. In the future, I think that breaking up production and teaching content into smaller sections to balance instruction with production will help students to see how an equilibrium in both does not overshadow the other. To address student concern with not having received enough Geography instruction, we can work on making sure we provide more time with social studies activities for future years.

Overall, I was happy with this project’s result. I loved seeing the reaction on all of the student’s faces when an unexpected image emerged from their mirrored design. Students were socializing and asking one another to show them how a specific image was created. There were many admirations that occurred in the room as students happily revealed their designs to one another. Moreover, students became creative and made meanings with accidental images that appeared on their mandala. By making creative connections, it taps into student’s short term or long term memory with meaningful symbolism.
5.8 Conclusions

I learned that my students and I have varying experiences and opinions for each project. I approached each project with enthusiasm and excitement because each decision had a reason behind it. The majority of my students really enjoyed all projects given but expressed that interdisciplinary was challenging. While I feel great that I am challenging them, I also do not want to deter a possible pathway in Visual Arts. Perhaps I should consider introducing one STEAM element as each unit progresses throughout the year to ease my students slowly into interdisciplinary education. For them, my existing integrated course is already an adjustment.

I have thoroughly enjoyed being in an integrated classroom the past four years taking on this course. I have learned so much about Geography in the past few years while planning and even while lessons take place live in the classroom. An experience like this has allowed me to learn best practices in teaching, classroom management, teacher and student rapport, and also grow intellectually. Additionally, I have even more respect each year for all subjects that I am not specialized in as I take on different roles in interdisciplinary education.

Teaching is an endless learning experience as the world continues to change, new relationships take place, new challenges are taken, and purposeful collaboration inquired. Being a part of this class has given me strength to empower others to take on interdisciplinary and perhaps even an integrated course. I am proud to say that the success of the GAGA class has open doors to even more integrated courses where my co-worker and I will take on new roles. In the following years, I will pilot another new integrated course with Chemistry as we graduate from GAGA. The geography teacher will take on a new role by starting an integrated class with Technology. We hope that our collaborative co-teaching experiences will enrich others, especially our new partners in integrated education. I look forward to building a new foundation
with the Chemistry teacher who will help provide me with science support, unique productions bridging science and art together, and most importantly, an unforgettable experience for everyone involved.
REFERENCES


Appendix A (Curriculum Map and Standards)

STANDARDS UNIT 1 Fundamentals to Geography and Art

Geography: N/A
Connecting Themes/Enduring Understandings Used in World Geography
Students should be able to demonstrate understanding of selected themes (depending on the course) using knowledge and skills acquired during the school year. Understanding of these themes is not the end product of a single unit or lesson, but the product of long term, ongoing instruction. The bold terms represent the connecting themes that appear in multiple units throughout this course. Enduring understandings transcend specific units and courses and increase student understanding and retention of knowledge.
Beliefs and Ideals: The student will understand that the beliefs and ideals of a society influence the social, political, and economic decisions of that society.
Conflict and Change: The student will understand that when there is conflict between or within societies, change is the result.
Conflict Resolution: The student will understand that societies resolve conflicts through legal procedures, force, and/or compromise.
Culture: The student will understand that the culture of a society is the product of the religion, beliefs, customs, traditions, and government of that society.
Distribution of Power: The student will understand that distribution of power in government is a product of existing documents and laws combined with contemporary values and beliefs.
Governance: The student will understand that as a society increases in complexity and interacts with other societies, the complexity of the government also increases.
Location: The student will understand that location affects a society’s economy, culture, and development.
Movement/Migration: The student will understand that the movement or migration of people and ideas affects all societies involved.
Production, Distribution, Consumption: The student will understand that the production, distribution, and consumption of goods/services produced by the society are affected by the location, customs, beliefs, and laws of the society.
Rule of Law: The student will understand that in a democracy, rule of law influences the behavior of citizens, establishes procedures for making policies, and limits the power of government.
Technological Innovation: The student will understand that technological innovations have consequences, both intended and unintended, for a society.

Art Standards:
VAHSVA.CR1. Visualize and generate ideas for creating works of art.
   a. Generate and conceptualize artistic ideas and work.
   b. Consider multiple options, weighing consequences, and assessing results.
   c. Practice the artistic process by researching, brainstorming, and planning to create works of art
VAHSVA.CR.2 Choose from a range of materials and methods of traditional and contemporary artistic practices to plan and create works of art.

VAHSVA.CR.3 Engage in an array of processes, media, techniques, and technology through experimentation, practice, and persistence.

- a. Demonstrate a variety of skills and techniques for two-dimensional and three-dimensional works of art.
- b. Demonstrate quality craftsmanship through proper care and use of tools, materials, and equipment.
- c. Utilize and care for materials, tools, and equipment in a safe and appropriate manner.

VAHSVA.CR.4 Incorporate formal and informal components to create works of art.

- a. Use principles of design to organize elements of art to create unified compositions.
- b. d. Create three-dimensional works of art that incorporate a variety of sculptural methods/materials and demonstrate an understanding of relief sculpture and sculpture in the round from a variety of materials (e.g. clay, paper, plaster, wood).

VAHSVACR.6 Keep an ongoing visual and verbal record to explore and develop works of art.

- a. Make visual/verbal connections through recording artistic research, planning, and reflection.
- b. Evaluate choice of media, techniques, and processes as a means to edit, revise, and modify works of art.
- c. Maintain notes and class information.

VAHSVA.PR.1 Plan, prepare, and present works of art for exhibition in school, virtual environment, and/or portfolio presentation.

- a. Exhibit works of art with a written supporting artist statement that communicates purpose and/or intent.

VAHSVA.RE.2 Critique personal works of art and the artwork of others, individually and collaboratively, using a variety of approaches.

- a. Self-evaluate in-progress and complete work using criteria such as composition, craftsmanship, technical skill, meeting goals of work, and progress over time.

VAHSVA.CN.1 Develop personal artistic voice through connecting uses of art within a variety of cultural, historical, and contemporary contexts.

- e. Identify specific knowledge and skills from other disciplines that inform the planning and execution of works of art.

VAHSVA.CN.2 Develop life skills through the study and production of art (e.g. collaboration, creativity, critical thinking, communication).

- b. Use creativity and imagination in planning and development of products.
- c. Use critical thinking and problem solving strategies to conceive of and develop ideas.

VAHSVA.CN.3 Utilize a variety of resources to understand how artistic learning extends beyond the walls of the classroom.

- a. Access resources to research art (e.g. museums, internet, visiting artists, galleries, community arts organizations, visual culture).
- c. Draw inspiration for works of art from the world and resources outside the traditional classroom.

S – SP1 Measuring average speed
T – ISTE 3a, 3b, 3c - Create an EMAZE PPT
E – FET5, FET6 - Designing shaft on hat to “travel” to the next destination using a ping pong ball.
A – See above for standards - Design a hat lantern of their favorite destination to illustrate the fundamentals of art and geography.
M - MGSE9-12.G.GMD.1, MGSE9-12.N.Q.2 - Circumference shaft, Solve Word Problems

**DATES**

August 1 – September 9

**PROJECT IDEA & DRIVING QUESTION/ AUTHENTIC PROBLEM OR SCENARIO**

**Driving Question:**
How can your literacy of place be illuminated through the foundations of geography and art?

**Project idea:**
Students will take us around the world by creating an illuminated 3D hat lantern of their favorite destination highlighting the connecting themes in Geography with selective elements and principles of art and design. The hat lantern will have a shaft to direct a ping pong ball (people) to travel to the next destination (hat).

**Enduring themes in Geography: Beliefs & Ideals**
Conflict & Change
Conflict Resolution
Culture
Distribution of Power
Governance
Individuals, Groups & Institutions
Location
Movement/Migration
Production, Distribution & Consumption
Rule of Law
Technological Innovation

**ESPN:** Economy, Society, Political, eNvironment

**TODALSIGS:** Title, Orientation, Date, Author/Artist, Legend, Scale, Index, Grid, Source (WARMUP MAP MONDAYS)

**Foundations in Art**
**Principles:** BECRUMP: Balance, emphasis, contrast, rhythm, contrast, unity, movement, pattern
**Elements:** FLVCSST: Form, line, value, color, shape, space, texture

**21ST CENTURY SKILLS/ SCHOOL WIDE LEARNING OUTCOMES**
Knowledge and Thinking:
1. Test over foundations in art and geography.
2. Project.

Written:
Students will write an artist statement to inform the audience of their work and explain the various fundamentals of geography and art used in their project.

Oral:
1. Students will give a short, verbal proposal for their hat lantern.
2. Students will present their completed sculpture to the class and explain why they were interested in this city.
3. Students will provide verbal, constructive critique of the sculpture including “I like”, “I wonder”, and areas for improvement.

Agency:
Students do independent research on their favorite destination (country).

Collaboration:
Students will participate in a “Travel Around the World” game by passing an illuminated ping pong hate through each hat’s shaft.

POTENTIAL PARTNERS (SHARED ASSESSMENT, GUEST SPEAKER, PANELIST, ETC.)

- Atlanta Lantern Parade – Beltline - September 9

STANDARDS UNIT 2 Physical Geography

Geography Standards:
SSWG1 Explain why physical characteristics of place such as landforms, bodies of water, climate, and natural resources act as contributing factors to world settlement patterns.
a. Identify and describe climates and locations of major physical features of North America. Explain how these physical characteristics impact settlement patterns including, but not limited to, the Mississippi River System, the Appalachian and Rocky Mountains, and the Canadian Shield.
b. Identify and describe climates and locations of major physical features of Central and South America. Explain how these physical characteristics impact settlement patterns including, but not limited to, the Andes Mountains, Amazon Basin, Atacama Desert, and the Pampas.
c. Identify and describe climates and locations of major physical features of Europe. Explain how these physical characteristics impact settlement patterns including, but not limited to, the Alps, Pyrenees, and Ural Mountains, and the Rhine, Danube, and Seine Rivers.
d. Identify and describe climates and locations of major physical features of Africa. Explain how these physical characteristics impact settlement patterns including, but not limited to, the Nile River Valley, the Sahara, the Kalahari Desert, the Sahel, and the Congo River Basin.
e. Identify and describe climates and locations of major physical features of Central and Southwest Asia. Explain how these physical characteristics impact settlement patterns.
including, but not limited to, the Zagros Mountains, Tigris and Euphrates Rivers, Persian Gulf and the Caspian Sea.

f. Identify and describe climates and locations of major physical features of South Asia, Southeastern Asia, and Eastern Asia. Explain how these physical characteristics impact settlement patterns including, but not limited to, the Himalayan Mountains and Tibetan Plateau, Gobi Desert, Ganges, Indus, Zhuang He, and Yangtze Rivers.

g. Identify and describe climates and locations of major physical features of Oceania, including Australia, New Zealand, and Antarctica. Explain how these physical characteristics impact settlement patterns including, but not limited to, the Great Dividing Range and Great Victoria Desert.

h. Describe the spatial distribution of natural resources, including, but not limited to, fuel and energy, agricultural, and mineral sources. Predict how distribution of natural resources continues to impact global settlement patterns.

Art Standards:

VAHSVA.CR.1. Visualize and generate ideas for creating works of art.
   a. Generate and conceptualize artistic ideas and work.
   b. Consider multiple options, weighing consequences, and assessing results.
   c. Practice the artistic process by researching, brainstorming, and planning to create works of art.

VAHSVA.CR.2. Choose from a range of materials and methods of traditional and contemporary artistic practices to plan and create works of art.

VAHSVA.CR.3. Engage in an array of processes, media, techniques, and technology through experimentation, practice, and persistence.
   a. Demonstrate a variety of skills and techniques for two-dimensional and three dimensional works of art.
   b. Demonstrate quality craftsmanship through proper care and use of tools, materials, and equipment.
   c. Utilize and care for materials, tools, and equipment in a safe and appropriate manner.

VAHSVA.CR.4. Incorporate formal and informal components to create works of art.
   a. Use principles of design to organize elements of art to create unified compositions.
   b. Create two-dimensional works of art that incorporate observational contour drawing, value to model form, and an understanding of perspective drawing.
   c. Learn fundamental color theory and the organization of color schemes to create works of art that demonstrate how to create meaning through color.
   d. Create three-dimensional works of art that incorporate a variety of sculptural methods/materials and demonstrate an understanding of relief sculpture and sculpture in the round from a variety of materials (e.g. clay, paper, plaster, wood).

VAHSVACR.6. Keep an ongoing visual and verbal record to explore and develop works of art.
   a. Make visual/verbal connections through recording artistic research, planning, and reflection.
   b. Evaluate choice of media, techniques, and processes as a means to edit, revise, and modify works of art.
   c. Maintain notes and class information.

VAHSVA.PR.1. Plan, prepare, and present works of art for exhibition in school, virtual environment, and/or portfolio presentation.
a. Exhibit works of art with a written supporting artist statement that communicates purpose and/or intent.

VAHSVA.RE.2 Critique personal works of art and the artwork of others, individually and collaboratively, using a variety of approaches.

a. Self-evaluate in-progress and complete work using criteria such as composition, craftsmanship, technical skill, meeting goals of work, and progress over time.

VAHSVA.CN.1 Develop personal artistic voice through connecting uses of art within a variety of cultural, historical, and contemporary contexts.

e. Identify specific knowledge and skills from other disciplines that inform the planning and execution of works of art.

VAHSVA.CN.2 Develop life skills through the study and production of art (e.g. collaboration, creativity, critical thinking, communication).

a. Collaborate in large and small groups with peers and community to examine, discuss, and plan projects.
b. Use creativity and imagination in planning and development of products.
c. Use critical thinking and problem solving strategies to conceive of and develop ideas.
d. Communicate meaning and ideas through a variety of means including visual representations, technology, and performance.

VAHSVA.CN.3 Utilize a variety of resources to understand how artistic learning extends beyond the walls of the classroom.

a. Access resources to research art (e.g. museums, internet, visiting artists, galleries, community arts organizations, visual culture).
b. Draw inspiration for works of art from the world and resources outside the traditional classroom.

S – SP1 - Lift, Drag, Gravity, Pressure, Force
https://www.gombergkites.com/nkm/why.html

T – ISTE 3a, 3b, 3c Emaze, ArcGIS

E – FET5, FET6-Kite shape design, prototype

A – See standards above -Marking Making Drawings, Technique Paintings, Color Theory

M - MGSE9-12.G.CO.10 - Geometry, Isosceles and Equilateral,
https://www.mathsisfun.com/triangle.html

**DATES**

September- October

**PROJECT IDEA & DRIVING QUESTION/ AUTHENTIC PROBLEM OR SCENARIO**

**Driving Question:**
How can art illustrate the impact of physical characteristics on human settlement?

**Project idea:**
Students will create a tetrahedral kite that will provide informative settlement patterns caused by physical characteristics. Each student will create 2 pyramids with different materials to illustrate specific physical characteristics with art techniques.
1. Tissue paper color symbolism and an ink drawing of physical features using mark making to display value, form, light (contrast), and space.
2. Plastic bag with sharpie isophytol alcohol technique to illustrate how climate affects settlement.

In addition, students will take part in guessing which kite will fly better.

**Impact of Physical features on settlement patterns in the following regions:**
- North America (1a)
- Central and South America (1b)
- Europe (1c)
- Africa (1d)
- Central and SW Asia (1e)
- South Asia, SE Asia, E. Asia (1f)
- Oceania (1g)

Impact of Spatial distribution of Natural resources on global settlement patterns (1h)

**21ST CENTURY SKILLS/ SCHOOL WIDE LEARNING OUTCOMES**

**Knowledge and Thinking:**
1. Test on SSWG1 (Geo) and Various Art content (artist, elements, and principles).
2. Project

**Written:**
Students will write an artist statement to inform the audience on findings of their work.

**Oral:**
1. Students will give a short, verbal proposal for their region, physical feature, and climate choice.
2. Students will present their artwork through an Emaze PPT and explain how the selected physical characteristics have on settlement pattern.
3. Students will provide verbal, constructive critique of the sculpture including “I like”, “I wonder”, and areas for improvement.

**Agency:**
Students do independent research on their selected physical characteristics and how it affects settle patterns.

**Collaboration:**
Students will help assemble the two different tetrahedral together in order to test which one will fly better.

- Tissue paper - physical feature - mark marking
- Plastic - climate - sharpie and alcohol
Kite race between 2nd and 3rd period for both tissue and aluminum tetrahedral kite.

**POTENTIAL PARTNERS (SHARED ASSESSMENT, GUEST SPEAKER, PANELIST, ETC.)**

- Atlanta World Kite Festival on Saturday, October 28 @ Piedmont Park

### Standards UNIT 3 Cultural Geography

**Geography Standards:**

SSWG2 Evaluate how the physical and human characteristics of places and regions are connected to human identities and cultures.

a. Examine how ethnic compositions of various groups has led to diversified cultural landscapes, including, but not limited to, architecture, traditions, food, art, and music.

b. Examine how language can be central to identity and a unifying or a divisive force (e.g., Bantu, French-Canadians (Quebecois), and Basques.

c. Examine the effects of universalizing and ethnic religions on local populations, including, but not limited to, Christianity, Judaism, Islam, Hinduism and Buddhism.

d. Examine the impact of cultural beliefs on gender roles and perceptions of race and ethnicity as they vary from one region to another (e.g., the caste system, apartheid, and legal rights for women).

e. Explain the processes of cultural diffusion and convergence through the effects of various media norms, transnational corporations, and technological advancements in transportation infrastructure (e.g., Coca-Cola and American fast food restaurants, social media networks, and universalized clothing choices).

**Art Standards:**

VAHSVA.CR1. Visualize and generate ideas for creating works of art.

a. Generate and conceptualize artistic ideas and work.

b. Consider multiple options, weighing consequences, and assessing results.

c. Practice the artistic process by researching, brainstorming, and planning to create works of art

VAHSVA.CR.2 Choose from a range of materials and methods of traditional and contemporary artistic practices to plan and create works of art.

VAHSVA.CR.3 Engage in an array of processes, media, techniques, and technology through experimentation, practice, and persistence.

a. Demonstrate a variety of skills and techniques for two-dimensional and three dimensional works of art.

b. Demonstrate quality craftsmanship through proper care and use of tools, materials, and equipment.

c. Utilize and care for materials, tools, and equipment in a safe and appropriate manner.

VAHSVA.CR.4 Incorporate formal and informal components to create works of art.

a. Use principles of design to organize elements of art to create unified compositions.

c. Learn fundamental color theory and the organization of color schemes to create works of art that demonstrate how to create meaning through color.
d. Create three-dimensional works of art that incorporate a variety of sculptural methods/materials and demonstrate an understanding of relief sculpture and sculpture in the round from a variety of materials (e.g. clay, paper, plaster, wood).

VAHSVA.CR.5 Reflect on, revise, and refine works of art considering relevant traditional and contemporary practices as well as artistic ideation.

VAHSVACR.6 Keep an ongoing visual and verbal record to explore and develop works of art.
   a. Make visual/verbal connections through recording artistic research, planning, and reflection.
   b. Evaluate choice of media, techniques, and processes as a means to edit, revise, and modify works of art.
   c. Maintain notes and class information.

VAHSVA.PR.1 Plan, prepare, and present works of art for exhibition in school, virtual environment, and/or portfolio presentation.
   a. Exhibit works of art with a written supporting artist statement that communicates purpose and/or intent.

VAHSVA.RE.1 Reflect on the context of personal works of art in relation to community, culture, and the world.

VAHSVA.RE.2 Critique personal works of art and the artwork of others, individually and collaboratively, using a variety of approaches.
   a. Self-evaluate in-progress and complete work using criteria such as composition, craftsmanship, technical skill, meeting goals of work, and progress over time.

VAHSVA.CN.1 Develop personal artistic voice through connecting uses of art within a variety of cultural, historical, and contemporary contexts.
   a. Discuss the intent of works of art in context to historical events.
   c. Analyze the ways in which personal experience affects the understanding and appreciation of works of art.
   d. Investigate the role of works of art as visual record keeper.
   e. Identify specific knowledge and skills from other disciplines that inform the planning and execution of works of art.

VAHSVA.CN.2 Develop life skills through the study and production of art (e.g. collaboration, creativity, critical thinking, communication).
   a. Collaborate in large and small groups with peers and community to examine, discuss, and plan projects.
   b. Use creativity and imagination in planning and development of products.
   c. Use critical thinking and problem solving strategies to conceive of and develop ideas.
   d. Communicate meaning and ideas through a variety of means including visual representations, technology, and performance.

VAHSVA.CN.3 Utilize a variety of resources to understand how artistic learning extends beyond the walls of the classroom.
   a. Access resources to research art (e.g. museums, internet, visiting artists, galleries, community arts organizations, visual culture).
   b. Identify various art related careers and post-secondary options.
   c. Draw inspiration for works of art from the world and resources outside the traditional classroom.
S – SC3.a, SC3.b, SC5.a. Obtain, evaluate, and communicate information about how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions - Chemistry Cooks

T – ISTE 3a, 3b, 3c

E – FET5 - describe in invention, innovation - solution to given problem

FET6 - visual and verbal communication to express design

A – Drawing Product

M - MGSE9-12.N.Q.1, Ratio and scaling

**DATES**

October - November

**PROJECT IDEA & DRIVING QUESTION/ AUTHENTIC PROBLEM OR SCENARIO**

**Driving Question:** How can cultural geography affect diet, and how can we illustrate this?

**Project Idea:** Students will create a McDonald's or Burger King menu complete with appetizers, soups, salads, entrees, and desserts that reflects the effect that culture and geography have on local food choices.

From the menu, students will only create a colored drawing to represent a burger/menu item (optional). They must create based on a country’s physical and human characteristic identity. In addition, students will participate in an after school cookout with the 9th grade cookout.

**Big Ideas:**

1. Relationships of ethnic compositions to cultural landscape (2a)
2. Effects of religion on a place (2c)
3. Process of cultural diffusion and convergence (2e)

**21ST CENTURY SKILLS/ SCHOOL WIDE LEARNING OUTCOMES**

**Knowledge and Thinking:**

1. Test on SSWG2 (Geo) and Various Art content (artist, elements, and principles.
2. Project

**Written:**

Students will write an artist statement to inform the audience on findings a creations of their work.

**Oral:**

1. Students will give a short, verbal proposal for their burger recipe.
2. Students will present their artwork through an Emaze PPT and explain how the selected physical characteristics have on settlement pattern.
3. Students will present and explain why they chose to have certain menu items featured. (For example, the dominate religion in the region may be Muslim and does not eat pork or the region is near the sea and shellfish is abundant).
4. Students will provide verbal, constructive critique of the sculpture including “I like”, “I wonder”, and areas for improvement.

Agency:
1. Workshops: What is culture?
   - Religion
2. Activity: Restaurant map of different cities
3. Match menu items country based on information provided (agriculture - physical, religion)
4. Create menu (appetizers, soups, salads, entrees, and desserts) to display knowledge of how resources, location, religion, and colonization may play a role in culture identification

Collaboration:
Students will work in groups to create a new burger recipe for a specific country’s Burger King menu as they show how cultural geography plays a role in diet.

Potential Partners (shared assessment, guest speaker, panelist, etc.)
- Burger King Representative?
- Mr. Shaeffer
- Parents and community at cookout

STANDARDS UNIT 4: Political Geography

Geography Standards:
SSWG3 Evaluate how cooperation and conflict among people influence the division and control of the earth’s surface.
a. Explain why political boundaries are created and why they change (e.g., nation, state vs. nation-state; political vs. ethnic sovereignty; the unrecognized states of Palestine, Kosovo, and Taiwan).
b. Explain how geography (size, shape, and relative location) can be an advantage or disadvantage to participation in global exchange (e.g., Chile, Indonesia, Russia, Canada, South Africa/Lesotho, Turkey, and Switzerland).
c. Explain the causes of external and internal conflicts among cultural groups, including but not limited to ongoing border disputes and separatist movements (e.g., partition of India, post-colonial Africa, and independence movements of the Scots, Kurds, and Basques).
d. Explain how political, economic, and social networks and organizations of global power influence places, countries, and regions (e.g., United Nations, NAFTA, African Union, the European Union, the Association of Southeast Asian Nations, 1961 Antarctica Treaty, Non-Governmental Organizations, and social media).

Art Standards:
VAHSSA.CR1. Visualize and generate ideas for creating works of art.
   a. Generate and conceptualize artistic ideas and work.
   b. Consider multiple options, weighing consequences, and assessing results.
c. Practice the artistic process by researching, brainstorming, and planning to create works of art

VAHSVA.CR.3 Engage in an array of processes, media, techniques, and technology through experimentation, practice, and persistence.
   a. Demonstrate a variety of skills and techniques for two-dimensional and three dimensional works of art.
   b. Demonstrate quality craftsmanship through proper care and use of tools, materials, and equipment.

VAHSVA.CR.4 Incorporate formal and informal components to create works of art.
   a. Use principles of design to organize elements of art to create unified compositions.
   c. Learn fundamental color theory and the organization of color schemes to create works of art that demonstrate how to create meaning through color.

VAHSVA.CR.5 Reflect on, revise, and refine works of art considering relevant traditional and contemporary practices as well as artistic ideation

VAHSVA.CR.6 Keep an ongoing visual and verbal record to explore and develop works of art.
   a. Make visual/verbal connections through recording artistic research, planning, and reflection.
   b. Evaluate choice of media, techniques, and processes as a means to edit, revise, and modify works of art.
   c. Maintain notes and class information.

VAHSVA.PR.1 Plan, prepare, and present works of art for exhibition in school, virtual environment, and/or portfolio presentation.
   a. Exhibit works of art with a written supporting artist statement that communicates purpose and/or intent.

VAHSVA.RE.1 Reflect on the context of personal works of art in relation to community, culture, and the world.

VAHSVA.RE.2 Critique personal works of art and the artwork of others, individually and collaboratively, using a variety of approaches.
   a. Self-evaluate in-progress and complete work using criteria such as composition, craftsmanship, technical skill, meeting goals of work, and progress over time.
   b. Develop skills and provide respectful and constructive criticism to peers as part of a community of learners.
   c. Develop a repertoire of contemporary and historical art exemplars through art criticism

VAHSVA.RE.3 Engage in the process of art criticism to make meaning and increase visual literacy.
   a. Create a written response to works of art through various approaches.

VAHSVA.CN.1 Develop personal artistic voice through connecting uses of art within a variety of cultural, historical, and contemporary contexts.
   a. Discuss the intent of works of art in context to historical events.
   c. Analyze the ways in which personal experience affects the understanding and appreciation of works of art.
   d. Investigate the role of works of art as visual record keeper.
   e. Identify specific knowledge and skills from other disciplines that inform the planning and execution of works of art.
VAHSVA.CN.2 Develop life skills through the study and production of art (e.g. collaboration, creativity, critical thinking, communication).
   a. Collaborate in large and small groups with peers and community to examine, discuss, and plan projects.
   b. Use creativity and imagination in planning and development of products.
   c. Use critical thinking and problem solving strategies to conceive of and develop ideas.
   d. Communicate meaning and ideas through a variety of means including visual representations, technology, and performance.

VAHSVA.CN.3 Utilize a variety of resources to understand how artistic learning extends beyond the walls of the classroom.
   a. Access resources to research art (e.g. museums, internet, visiting artists, galleries, community arts organizations, visual culture).
   b. Identify various art related careers and post-secondary options.
   c. Draw inspiration for works of art from the world and resources outside the traditional classroom.

<table>
<thead>
<tr>
<th>S- SP1.f</th>
<th>T- ISTE 3a, 3b, 3c</th>
<th>E- FET3 - Warfare Technology; (c) Describe the role of time, capital, people, tools and machines, energy, materials, and information within the universal systems model. (initial project)</th>
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<tr>
<td>A- Game Cover Design – New Project is Digital Mandala - See standards above</td>
<td>M-MGSE9-12.N.Q.2, word problem (initial project) – Mandala Geometry - MGSE9-12.G.CO.10 Prove theorems about triangles: measures of interior angles of</td>
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**DATES**

November - December

**PROJECT IDEA & DRIVING QUESTION/ AUTHENTIC PROBLEM OR SCENARIO**

**Driving Question:**
How can aesthetics influence decision making of consumers?

**DQ changed to:**
How can creative symbolism express the mission of influential organizations on people and government?

**Project Idea:**
Students will participate in a web 4.0 game titled Peacemaker to understand the Israeli Palestinian conflict to create a graphic game cover design for Peacemaker using Photoshop. Moreover, students will learn about advertising elements and graphic designing basics.

**Project idea changed to:** (SSWG3.d)
Students will create a digital mandala to symbolize and express the mission of a non-government organization (NGO) and its influence on people.

**21ST CENTURY SKILLS/ SCHOOL WIDE LEARNING OUTCOMES**
**Knowledge and Thinking:**
1. Summative Test on SSWG3 and various art content
2. Project

**Written Communication:**
Students will write an artist statement to inform the audience on findings a creations of their work.

**Oral Communication:**
1. Presentation on NGO mandalas.
2. Students will provide verbal, constructive critique of the sculpture including “I like”, “I wonder”, and areas for improvement.

**Agency:**
Students will take part in independent research in order to find creative ways of symbolizing an NGO.

**Collaboration:**
Critique

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<tr>
<th>Potential Partners (shared assessment, guest speaker, panelist, etc.)</th>
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<tbody>
<tr>
<td>- Game Designers</td>
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<tr>
<td>- PeaceMaker</td>
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<tr>
<td>- PROJECT CHANGED TO NGO - MANDALAS</td>
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Appendix B Unit 1 Pre-test.

**Unit 1 Pretest**
1. Which of the following statement is true?
   a. Shape is flat and form has dimensions
   b. Shape has dimensions and form is flat
   c. Shape is flat and form is flat
   d. Shape has dimension and form has dimension

2. Which of the following display the correct color theory for creating secondary colors?
   a. Red + Blue → Orange, Yellow + Blue → Green, Red + Yellow → Purple
   b. Red + Blue → Purple, Yellow + Blue → Orange, Red + Yellow → Green
   c. Red + Blue → Orange, Yellow + Blue → Purple, Red + Yellow → Green
   d. Red + Blue → Purple, Yellow + Blue → Green, Red + Yellow → Orange

3. Positive space is
   a. The background
   b. A series of different prints
   c. An optimistic view
   d. The subject

Use the provided Physical Map at the end of this pre-test to identify the following:
  4. The Mississippi River System
  5. The Rocky Mountains
  6. The Appalachian Mountains

7. The elements of art is/are
   a. The foundations and fundamental to creating art
   b. The outcome of designing a product
   c. A prototype
   d. Fire, Water, Wind, and Earth

8. The length of an inclined ramp is 15 inches and it took 3 seconds for the ping pong ball to reach the stopper. What is the average speed of the ping pong ball?
   a. .2 inches per second
   b. .2 miles per second
   c. 5 inches per second
   d. 5 miles per second

9. In question #8, you computed an answer that had units of inches per second. This answer is an example of
   a. the position of the ball
   b. the average rate of change of the ball’s position
   c. the speed of the ball
   d. the velocity of the ball
10. Which color scheme would be the best choice to represent the climate of Canada?
   a. Warm
   b. Tertiary
   c. Cool
   d. Primary

11. Below is the yearly average temperature of different locations. Which average temperature would most likely support the largest human population?
   a. -13 to 5 degrees (F)
   b. 95 to 104 degrees (F)
   c. 41 to 50 degrees (F)
   d. 5 to 14 degrees (F)

12. Which of the following method/methods describe the processes of creative design?
   a. Draw and paint
   b. Brainstorm and sketch
   c. Brainstorm, sketch, draw
   d. Brainstorm, sketch, draw, production, observe/critique, and revise

13. A marble took 32 seconds to reach a stopper inside an inclining tunnel. The length of the tunnel is 4 feet long. What is the average speed in which the ping pong ball traveled?
   a. .125 inches per second
   b. 8 feet per second
   c. 28 inches per second
   d. 1.5 inches per second
***Questions 14-16 are worth 2pts each

____________PLEASE COMPLETE 14-16 ON NOTEBOOK PAPER____________

14. What are two possible economic activities that people that live near large bodies of water such as, the Atlantic Ocean, the Great Lakes, or the Gulf of Mexico might participate in?

____________PLEASE COMPLETE ON NOTEBOOK PAPER____________

15. Give three examples of how the climate in which people live might affect how they live. Some climate examples are tropical, polar, or hot arid. You may choose to use a different climates than the ones given as examples.

____________PLEASE COMPLETE ON NOTEBOOK PAPER____________

16. How can physical features such as landforms be a benefit or deterrent to people settling a particular place?

____________PLEASE COMPLETE ON NOTEBOOK PAPER____________

Use the provided Physical Map to identify #17
17. Identify the Atlantic Ocean

18. What are the seven elements of art?
   a. line, color, space, size, form, pattern
   b. line, color, form, space, shape, value, pattern
   c. line, color, space, size, value, shape, form
   d. line, color, space, form, shape, value, texture

#4-8, 15 PHYSICAL MAP
Appendix B.1 (Quiz 4)

QUIZ 4

1. Justin traveled 9 miles in 4 minutes cruising on his BMW. What is his average speed?
   a. 6.8 miles per minute
   b. 2.25 miles per minute
   c. .5 miles per minute
   d. .44 miles per minute

2. Convert his average speed from miles per minute into miles per hour.
   a. 408 miles per hour
   b. 135 miles per hour
   c. 30 miles per hour
   d. 26.4 miles per hour

3. It took 5 minutes for our class to pass the ping pong ball around the 10 inches of combined ramps. It then took us about 10 minutes to do it again. What is the average speed of the ping pong ball? REMEMBER, TOTAL DISTANCE / TOTAL TIME!
   a. 1.75 inches per minute
   b. 1.33 inches per minute
   c. .75 miles per minute
   d. 2 miles per minute

4. The appearance of motion is called:
   a. Emphasis
   b. Movement
   c. Contrast
   d. Unity

5. The biggest holiday in the Hindu Calendar and is seen as a lantern celebration is
   a. Loy Kratong
   b. Sky Lantern
   c. Diwali
   d. Floating Lantern

6. ____________ is the wealthiest country in Southeast Asia partly because it is located on a major trade route.
   a. Thailand
   b. Vietnam
   c. Singapore
   d. Laos
7. Which of the following is NOT one of the 3 regions of Oceania?
   a. Micronesia
   b. Polynesia
   c. Melanesia
   d. Indonesia

8. The only landlocked country in Southeast Asia is ______________.
   a. Laos
   b. Vietnam
   c. Singapore
   d. Taiwan

9. New Delhi is the capital of which country?
   a. Afghanistan
   b. Nepal
   c. India
   d. Sri Lanka

10. People known as “untouchables” were in the lowest position of a social system called a
    ________________.
    a. Social security
    b. Hierarchy
    c. Socioeconomics
    d. Caste system
Appendix B.2 (Unit 1 Post-test)

Unit 1 Test

1. Below is a picture of a lantern hat. From this picture, we can state that this lantern has what kind of balance?

![Lantern Hat Image]

a. Asymmetrical  
b. Symmetrical  
c. Radial  
d. Symmetrical

2. Below is a picture of a lantern hat. From this picture, we can state that this lantern has what kind of balance?

![Lantern Hat Image]

a. Asymmetrical  
b. Symmetrical  
c. Radial  
d. Symmetrical
3. In order for us to wear our lantern hat, it must have
   a. Contrast
   b. Color
   c. Form
   d. Movement

4. Unity, form, texture, balance, contrast, shape, emphasis are
   a. The elements of art
   b. The principles of art
   c. The elements and principles of art
   d. The themes of geography

5. Unity, movement, balance, rhythm, pattern, emphasis, contrast are
   a. The elements of art
   b. The principles of art
   c. The elements and principles of art
   d. The themes of geography

6. The image to the east displays
   a. Geometric shape
   b. Geometric form
   c. Organic shape
   d. Organic form

7. Which of the following is TRUE?
   a. Green + Yellow = Blue
   b. Yellow and Blue = Green
   c. Yellow + Orange = Red
   d. Red + Blue = Orange

8. Ms. Nguyen’s lantern has high contrast because she used complementary colors on hat. Which of the following colors did she used? Think about the mnemonic devices learned in class.
   a. Red and Yellow
   b. Yellow and Purple
   c. Green and Orange
   d. Orange and Purple

9. The elements and principles of art are the foundations to creating art. Which of the following is true?
   a. These are the themes of art and geography
   b. These are the ESPN of art
   c. Elements is the recipe as principles are the ingredients
   d. Elements are the ingredients as principle is the recipe.
10. The image south of this question’s positive space is

![Birds Image]

a. White - Birds
b. Black - Birds
c. White - Sky
d. Black – Sky

11. Rita had a terrible day at school for yelling in class. She was asked to draw a portrait of herself and used a rainbow to express her emotions and feelings at the time she got in trouble. Which color scheme would best express this?
   a. Primary
   b. Neutral
c. Cool
d. Warm

12. Amin presented his lantern hat in class and was extremely nervous. There were multiple times where he froze, could not speak, and you can see the nervousness on his face. If he was asked to create a portrait and used colors to express his emotions and feelings at the time of presentation, what color scheme would best express this?
   a. Primary
   b. Neutral
c. Cool
d. Warm

13. The creative process of the lantern hat involved many steps. Which of the following method/methods describe the processes of creative design?
   a. Draw and paint
   b. Brainstorm and sketch
c. Brainstorm, sketch, draw
d. Brainstorm, sketch, draw, production, observe/critique, and revise
14. It took Terrell, Lanya, Kidane, Ayana, Patrick, Shacari, and Saniya 15 minutes to “travel around the world” using a ping pong ball with 40 inches of combined ramps. What is their average speed?
   a. .38 inches per minute  
   b. .68 inches per minute  
   c. 1.5 inches per minute  
   d. 2.67 inches per minute

15. Convert their average speed from inches per minute inches per hour
   a. 22.8 inches per hour  
   b. 40.8 inches per hour  
   c. 90 inches per hour  
   d. 160.2 inches per hour

16. It took Iyonah, TJ, Jalen, Jango, and Jarvis 10 minutes to “travel around the world” using a ping pong ball with 12 inches of combined ramps. They repeated this again and traveled from the last destination not the first destination in 5 minutes. What is the average speed for their trip?
   a. .625 inches per min  
   b. .625 miles per min  
   c. 1.6 inches per min  
   d. 1.6 miles per min

17. In question #14 and 16, you computed an answer that had units of inches per minute. This answer is an example of
   a. the position of the ball  
   b. the average rate of change of the ball’s position  
   c. the speed of the ball  
   d. the velocity of the ball

18. This lantern festival and holiday is celebrated in Hawaii. Individuals will write down payers and letters to beloved individuals who have passed away.
   a. Loy Kratong  
   b. Sky Lantern  
   c. Diwali  
   d. Floating Lantern

19. This sky lantern festival originated in Southeast Asia in Thailand. It has influenced many events around the world such as the Rise Lantern in Nevada, upcoming Rise Lantern in Atlanta - Alabama, and the movie Tangled.
   a. Petra Treasury  
   b. Floating Lantern  
   c. Spring Lantern  
   d. Loy Kratong
20. If a dog is painted on a piece of paper or canvas, what kind of texture does this painting have?
   a. Implied  
   b. Tactile  
   c. Rough  
   d. Trajectory

21. The use of repetition in an artwork to create motion is best described as
   a. Movement  
   b. Balance  
   c. Contrast  
   d. Texture

22. The image to the right display what type of balance? ***Color does not count!
   a. Asymmetrical  
   b. Symmetrical  
   c. Radial  
   d. Samesemtrical

23. How can we make yellow?
   a. Blue + Green  
   b. Red + Purple  
   c. Green + Purple  
   d. None of the above

24. Depiction of distance by separating planes through the use of horizon line and manipulation of size.
   a. Space  
   b. Size  
   c. Grounds  
   d. Illusion
25. Jourdan, Dave, Malik, and Diamond practice several times to get the shortest time possible to travel through their 24 inches of combined ramp. Their best time was 8 minutes. What was their average speed? *BEWARE OF YOUR UNITS!!!*
   a. .8 ft/min
   b. .6 ft/ min
   c. .25 ft/ min
   d. .45 ft/ min

26. Which is an example of an absolute location?
   a. South of London
   b. Northern Hemisphere
   c. 1600 Pennsylvania Avenue
   d. 30 N Latitude, 150 W Longitude

27. What are the 7 continents?
   a. Asia, Africa, North America, South America, Antarctica, Europe, Australia
   b. Europe, Asia, Africa, United States, China, Germany, Australia
   c. Columbia, Africa, Asia, Germany, Iceland, Six, Hopi
   d. United States, Asia, Africa, Europe, Australia

28. What are latitude lines?
   a. I don't know
   b. Lines Drawn up and down
   c. Lines
   d. Lines Drawn East-West

29. Which maps show the boundaries of states and countries?
   a. Political
   b. Population Density
   c. Physical
   d. Resource

30. What is this object known as?

   a. map symbol
   b. map key
   c. map scale
   d. compass rose
31. 40.4406° N, 79.9959° W describes the _____________ location of Pittsburgh, PA.
   a. Relative
   b. Absolute
   c. Regional
   d. Political

32. Name this Country

   ![Image of Brazil]

   a. Uruguay
   b. Peru
   c. Brazil
   d. Bolivia

33. A transportation corridor in South America
   a. Andes Mountain
   b. Amazon River
   c. Nile River
   d. Mississippi River

34. What ocean lies directly to the East of South America?
   a. Pacific Ocean
   b. Arctic Sea
   c. Indian Ocean
   d. Atlantic Ocean

35. Australia’s main cities are located along its coastlines for which of the following reasons?
   a. it was cheaper to buy along the coast
   b. the railroads were only built around the coast to avoid dangerous animals in the outback
   c. the interior is desert or mountainous and there is fishing, water and trading along the coast
   d. Australians wanted to live close to the surfing
36. The physical geography of Oceania has most likely causes societies in the region to

- build homes from stone
- become isolated on various islands
- use ocean water for irrigation
- depend on a diet of citrus fruit

37. Polynesia gets its name from Greek words meaning many islands. If nesoi means island, what does the first part of the compound word mean?

- Pacific
- Many
- Small
- Hawaiian

38. Which of the following is a part of Oceania?

- Austria
- Britain
- Polynesia
- Indonesia

39. India was a colony of what European country before it gained independence

- Britain
- Germany
- Portugal
- India was never colonized
40. What country is represented with #2?

- a. Pakistan
- b. India
- c. Nepal
- d. Bangladesh

41. What role do natural resources play in a country’s “E” (economy)?
   - a. Countries will export what they have and import what they do not
   - b. Countries will try to build up their natural resources
   - c. Natural resources are already there
   - d. All of the above

42. If a resource is "abundant", that means the resource is
   - a. renewable
   - b. man-made
   - c. available in large amounts
   - d. only found in Western Hemisphere

43. In 1947, the British government withdrew from Palestine and turned the problem over to….
   - a. Ottoman Empire
   - b. United States
   - c. European Union
   - d. United Nations
44. Identify this region

- a. Vietnam
- b. Southeast Asia
- c. South Asia
- d. Indonesia

45. Where are most cities in Egypt located?

- a. On or Near the Nile River
- b. In the desert
- c. Close to the Atlantic Ocean
- d. No major cities
46. What is the most crucial resource in Southwest Asia?
   a. air
   b. water
   c. diamonds
   d. coal

47. In which part of the country is the majority of China's population density?
   a. North
   b. South
   c. East
   d. West

48. Which of the following landforms dominate western China?
   a. deserts and salt marshes
   b. mountains and plateaus
   c. rivers and lakes
   d. plains and hills

49. What are the arrows pointing to?
   a. Altai Mountains
   b. Ural Mountains
   c. Caucasus Mountains
   d. Himalaya Mountains

50. What country have been test launching nuclear weapons recently?
   a. South Korea
   b. Saudi Arabia
   c. India
   d. North Korea
Appendix B.3 (Unit 1 Reflection)

Unit 1 Lantern Reflection

For this unit, you created a lantern and learned several different content knowledge from diverse academic disciplines. Answer the questions below to reflect upon what you have learned in this unit.

1. Write a brief description of what you created and the intent of the product.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

2. How does this project address art? What artistic choices did you make to illustrate your understanding of the elements and principles of art?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

3. Explain how this project addresses geography.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

4. STEAM is an acronym for Science, Technology, Engineering, Art and Math. In your opinion, how did this project address STEAM?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

5. We hope that this project has been fun and educational for you. Do you think this project made a connection between Art and Geography? Why or why not?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
6. What improvements can be made to this project so that Art and Geography contents are better integrated?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
                                                                                   
7. What could have been expanded on this project beyond Art and Geography? For example, were there certain things you personally made a connection with as you participated in this project that was not covered or fully covered in class? Be creative, there are no limits.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
                                                                                   
8. What is your overall opinion of the project? Did you like it? Why?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
                                                                                   
9. How did you do on your project? Are you satisfied with it? What would you change to make it better?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
                                                                                   
10. How did you do on your presentation? What are some likes and areas of improvement?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
                                                                                   

________________________________________________________________________
Lesson Overview of Major Concepts:
Students will research one country as a group and will each create a ceramic burger that will reflect the effects culture and geography have on local food choices. The effects of culture will highlight the following and should reflect artistic decision of the ceramic burger:

1. Relationships of ethnic compositions to cultural landscape (2a)
2. Effects of religion on a place (2c)
3. Process of cultural diffusion and convergence (2e)

Essential Questions:
How can cultural geography affect diet, and how can we illustrate this?

PSC or Content Standards:

**Engineering**
FET5 - describe in invention, innovation - solution to given problem
FET6 - visual and verbal communication to express design

**Art Standards:**
VAHSVA.CR.1. Visualize and generate ideas for creating works of art.
   a. Generate and conceptualize artistic ideas and work.
   b. Consider multiple options, weighing consequences, and assessing results.
   c. Practice the artistic process by researching, brainstorming, and planning to create works of art

VAHSVA.CR.2 Choose from a range of materials and methods of traditional and contemporary artistic practices to plan and create works of art.

VAHSVA.CR.3 Engage in an array of processes, media, techniques, and technology through experimentation, practice, and persistence.
   a. Demonstrate a variety of skills and techniques for two-dimensional and three dimensional works of art.
   b. Demonstrate quality craftsmanship through proper care and use of tools, materials, and equipment.
   c. Utilize and care for materials, tools, and equipment in a safe and appropriate manner.

VAHSVA.CR.4 Incorporate formal and informal components to create works of art.
   b. Use principles of design to organize elements of art to create unified compositions.
   e. Create three-dimensional works of art that incorporate a variety of sculptural methods/materials and demonstrate an understanding of relief sculpture and sculpture in the round from a variety of materials (e.g. clay, paper, plaster, wood).

VAHSVA.CR.5 Reflect on, revise, and refine works of art considering relevant traditional and contemporary practices as well as artistic ideation.
VAHSVACR.6 Keep an ongoing visual and verbal record to explore and develop works of art.
   a. Make visual/verbal connections through recording artistic research, planning, and reflection.
   b. Evaluate choice of media, techniques, and processes as a means to edit, revise, and modify works of art.
   c. Maintain notes and class information.

VAHSVA.RE.1 Reflect on the context of personal works of art in relation to community, culture, and the world.

VAHSVA.CN.1 Develop personal artistic voice through connecting uses of art within a variety of cultural, historical, and contemporary contexts.
   a. Discuss the intent of works of art in context to historical events.
   c. Analyze the ways in which personal experience affects the understanding and appreciation of works of art.
   d. Investigate the role of works of art as visual record keeper.
   e. Identify specific knowledge and skills from other disciplines that inform the planning and execution of works of art.

VAHSVA.CN.2 Develop life skills through the study and production of art (e.g. collaboration, creativity, critical thinking, communication).
   b. Use creativity and imagination in planning and development of products.
   c. Use critical thinking and problem solving strategies to conceive of and develop ideas.
   d. Communicate meaning and ideas through a variety of means including visual representations, technology, and performance.

VAHSVA.CN.3 Utilize a variety of resources to understand how artistic learning extends beyond the walls of the classroom.
   a. Access resources to research art (e.g. museums, internet, visiting artists, galleries, community arts organizations, visual culture).
   b. Identify various art related careers and post-secondary options.
   c. Draw inspiration for works of art from the world and resources outside the traditional classroom.

Geography
SSWG2 Evaluate how the physical and human characteristics of places and regions are connected to human identities and cultures.
   a. Examine how ethnic compositions of various groups has led to diversified cultural landscapes, including, but not limited to, architecture, traditions, food, art, and music.
   e. Explain the processes of cultural diffusion and convergence through the effects of various media norms, transnational corporations, and technological advancements in transportation infrastructure (e.g., Coca-Cola and American fast food restaurants, social media networks, and universalized clothing choices).

Objectives:
Students will research how culture geography affects diet and create a ceramic burger in 7-11 days. In addition, students will gain knowledge of how the different stages of ceramics, ceramic tools, ceramic studio safety, and the advancement of technology has allowed for rapid production of art (kiln).
Sample:

Resources:

Vocabulary:
- Green ware: Workable clay that still have moisture and not yet fired
- Bisque ware: Clay that has been fired once and harden.
- Glaze ware: Clay that has been fired twice and have a protective coat of glaze
- Ceramics: Objects made using clay and harden by heat
- Culture: Characteristics that reflect a group of people by religion, music, art, beliefs, traditions, location, language, and other social aspects.

Introduction/Motivation:
The lesson will be introduced with the following question:
1. How can cultural geography affect diet, and how can we illustrate this?

Content Paper:
- PowerPoint
Instructor’s Procedures:

**DAY 1**

1. Prior to this lesson, students should have received a lesson about culture or cultural geography and how this affects human habits, lifestyle, consumerism, etc.
2. Start the lesson with the attached PowerPoint.
3. This PowerPoint or Google Slide will present students with the driving question:
   a. How can cultural geography affect diet, and how can we illustrate this?
4. Allow students to answer this. Provide specific examples such as…
   a. In India, people do not consume beef because it is against their religion. In fact, cows are considered a sacred. Because of this, it will be hard to find a beef patty burger in India.
   b. In China, the food source available is different than the United States due to agriculture, location, and diet. Likewise, taro is often found in Asian menus such as the taro dessert for McDonald's in China.
5. Let students know that more discoveries will be made as examples of burgers around the world will be seen throughout the PowerPoint.
6. Present to students the project idea and art media right after the driving question.
   a. Students will research how culture geography affects diet and create a ceramic burger in 7-10 days. In addition, students will gain knowledge of how the different stages of ceramics, ceramic tools, ceramic studio safety, and the advancement of technology has allowed for rapid production of art (kiln).
7. Go directly into providing a sample of a ceramic burger and how realistic it looks. Let students know ceramic notes will be taken very soon after the project idea has been provided.
8. Present images and a chart of different burgers around the world.
   a. Some examples provided are McDonalds burger from Philippines, Germany, China, India, etc.
   b. Ask and make connections about why certain burgers exist and in that particular country. These connections should relate to location, religion, and agriculture.
9. Continue on and introduce ceramics to students. This introduction includes ceramic stages, tools, safety, and materials used in ceramics.
10. Once the PowerPoint presentation has been completed, review the project idea again with students.
11. Place students in groups of 3-4 or have students choose their own group.
12. Have each group decide on one country they would like to represent or present a select few that groups can choose from.
13. Once a country has been selected, pass out a Ceramic Burger Research Guide sheet (Appendix C.1) to each student to research.

**Day 2**

14. Review project idea with students.
15. Have students continue to research for half of the class period.
16. Halfway through class, have students share within their group individual findings.
17. Have each group come up with a unique recipe to represent their country.
18. Have each student create a sketch of what the burger will look like, colors, and written notes. Sketches are to represent a single burger recipe that the group agreed on.
19. Have students complete sketches for homework if time is up.
**Day 3**

**Prep:**

20. Use a cutting wire to cut the large block of clay into smaller ones for students to use.
21. Place each block of clay into a plastic Ziploc bag to distribute easily.
22. Place one or two of each tool in a container for students to use at their table.
23. Review the project idea with students.
24. Let students know that today, students will start working with real clay.
25. Have students share their sketch with each other and select the best one in terms of burger shape, arrangement of ingredients, and presentation of ingredients.
   a. Groups also have the option to draw a final sketch after group sketch discussion.
26. Once the majority of groups have agreed on a final sketch, settle class to have a demo on ceramics.
27. Pass out a sharpie to each table and let students know they will use it to write their name and period on the Ziploc bag that contains their clay.
28. Pass out a bag of clay to each student and remind students not to open it until permission has been given.
29. If possible, have the slide of steps on how to create a pinch pot for the top burger bun on the screen while the demo take place.
30. Start out explaining pliable clay, air bubbles, and throwing to students.
31. Then, have students take their clay out and squeeze the clay together to pop air bubbles that are present in the existing clay.
32. After two – 5 minutes, have students split their clay into two pieces as evenly as possible.
33. Take one of the clay, roll into a ball, and have students follow along.
34. Have students put down their ball and pay close attention on how to make a pinch pot.
35. Then, demonstrate to students how to pat the pinch pot down to make it wider and lower to resemble the top bun of a burger. This can be done with a wooden rib or hand.
36. Have students create a pinch pot as teacher walk around to provide individual help.
37. After most students have gotten this process down, have students stop and put down all clay for the next demonstration.
38. Take the remaining clay and roll it into a ball.
39. Place the ball of clay between the two hands and squish it together so that it will become flat like the bottom bun of a burger.
40. Ask students: Why is it NOT a good idea to flatten the clay on the table?
   a. Answer: It will get stuck to the table.
41. Have students do this and walk around to provide help.
42. Bring a spray bottle around to spray any clay that is starting to crack.
43. Have students write their name on the bottom of the burger.
44. Have students clean up and place all work in a safe and designated area.
45. Have a student volunteer to pick up ceramic tool containers.
46. Provide cloths or rags for students to clean the table.
47. Dismiss students properly wash their hands.

**Day 4-6**

48. Review project idea and ceramic work done last class.
49. Demonstrate how to make a coil for onions and other ingredients.
50. Demonstrate how to create pickles, and other flat round ingredients using the flatten method between palms.
51. Demonstrate how to smooth clay using specific materials such as metal rib, wooden rib, boxwood, and plastic spoon to burnish.
52. Demonstrate how a sponge can be used to smooth clay and also keep work moist.
53. Pass out student work or dismiss students by table to get their work.
54. On day 5 or 6, show students how to hollow the center of the burger so that the clay can dry evenly to prevent it from cracking.
55. Students who are complete with their work need to place the artwork in the bag left open to air dry.
56. On day 6, all student work should be complete and need to be left to dry for at least two days prior to putting in the kiln.

**Day 7-10**

**Prep: Load the Kiln and fire all green ware while student make a restaurant or fast food menu.**

57. Have students work in their groups to create a menu flyer for their restaurant or fast food chain.
58. Let students know the menu must include an entrée, sides, drinks, and desserts. These menu item must reflect the culture of the country chosen.
59. Once bisque ware have cool down and ready to be glazed, review to students the stages of clay.
60. Ask students what stage the clay is in now that it has been placed in the kiln.
61. Review materials used in ceramics especially glaze.
62. Demonstrate to students how to glaze.
63. Warn students not to glaze the bottom, overlap glazes, and only use what is needed.
64. Remind students that at least 3 coats of glazes are needed to ensure good coverage.
65. Provide glaze samples to each table and have students agree on colors needed for their burger.
66. While glaze colors are being chosen, pass out bisque ware to students.
67. Select one student to pass out brushes and rags.
68. Select one student to pass out aprons.
69. Select one student to pass out water cups.
70. Have one representative from each group come up to get the glazes needed to begin glazing. Teacher will pour glazes onto the paint palette to prevent excessive loss of glazes.
71. On Day 9 or 10 have students separate their work to load into the kiln for the 2nd time.
72. Have students clean up each day by washing their paint palette and brushes.
73. Make sure students wipe their tables and sweep the floor if needed.

**Day 10-11**

74. On Day 10 or 11, load bisque ware and take out glaze ware.
75. Provide students their work back on critique (another lesson).

**Materials and Management:**
Bag for each student to store ceramic burger
Ceramics tools: pin tool, wooden rib, metal rib, boxwood, plastic spoon, sponge, wire tool, loop tool, pear shaped loop tool, paint brush
Container for tools per table
Rags or towels
Spray bottle
Sharpie
Space to place all materials
Aprons
Paint Palette

**Student Procedures**

**DAY 1**

1. Students will listen and take notes on a PowerPoint that introduces project idea and ceramics.
2. Students will answer the driving question:
   a. How can cultural geography affect diet, and how can we illustrate this?
3. Students will see visuals of burgers around the world and make connections to culture, location, religion, and cultural diffusion.
4. Students will be presented and note down the project idea.
5. Students will continue on and take notes on the introduction of ceramics regarding stages, tools, safety, and materials used in ceramics.
6. Students will be placed in groups of 3-4 or choose their own group.
7. Each group will decide on one country they would like to represent.
8. Students will receive a Ceramic Burger Research Guide sheet (Appendix C.1) to research about potential burgers in their country and popular traditional foods/ingredients.

**Day 2**

9. Students will research for half of the class period.
10. Halfway through class, students will share within their group individual findings.
11. Each group will come up with a unique recipe to represent their country.
12. Each student will create a sketch of what the burger will look like, colors, and written notes. Sketches are to represent a single burger recipe that the group agreed on.

**Day 3**

13. Students will share their sketch with each other and select the best one in terms of burger shape, arrangement of ingredients, and presentation of ingredients.
   a. Groups also have the option to draw a final sketch after group sketch discussion.
14. Students will write their name on the Ziploc bag that contains their clay once received.
15. Students will listen to ceramics demo by teacher.
16. Students will follow along with teacher during demo when given permission.
17. Students will raise their hand if they need their clay to be sprayed with water to prevent it from drying out.
18. Students will write their name on the bottom of the burger.
19. Students will clean up and place all work in a safe and designated area.
20. One student will volunteer and pick up ceramic tool containers.
21. Students will clean tables with a rag.
22. Students will wash their hands and be dismissed

**Day 4-6**

23. Students will listen to demonstration on how to create coils and other techniques for specific ingredients.
24. Students will listen to use of tools and demonstration made by teachers.
25. Students will receive or get their work and create their ceramic burger.
26. On day 5 or 6, students will learn and hollow the center of the burger so that the clay can dry evenly to prevent it from cracking.
27. Students will place their artwork in the bag and leave it open to air dry.
28. On day 6, all student work should be completed and need to be left dry for at least two days prior to putting in the kiln.

**Day 7-10**
29. Students will work in their groups and create a menu flyer for their restaurant or fast food chain.
30. Students will include an entrée, sides, drinks, and desserts and reflect the culture of the country chosen.
31. Students will participate in stages of ceramic review and glaze introduction.
32. Students will learn than they are NOT to glaze the bottom, overlap glazes, and only use what is needed.
33. Students will glaze at least 3 coats to ensure good coverage.
34. Students will agree on glaze colors needed for their burger using the glaze samples.
35. One student will pass out brushes and rags.
36. One student will pass out aprons.
37. One student will pass out water cups.
38. One representative from each group will get the glazes needed to begin glazing.
39. On day 9 or 10, students will separate their work to load into the kiln for the 2nd time.
40. Students will clean up each day by washing their paint palette and brushes.
41. Students wipe their tables and sweep the floor if needed.

**Day 10 -11**
42. Student will get their work back on day of critique (another lesson)

**Closure/Review:**
Now that we are done with our project, can someone share what we learned and created as a result this lesson? *(We created a ceramic burger to show……)*

**Assessment Questions:**
1) Does the burger reflect a creative design and recipe that does not exist yet?
2) Are the ingredients of the burger reflective of the culture studied?
3) How is the student's craftsmanship with glazing?
4) How is the student's craftsmanship with ceramic building?
5) Is the project complete and turned in on time for presentation/exhibition?
Assessment Rubric:

<table>
<thead>
<tr>
<th></th>
<th>0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Does the burger reflect a</strong></td>
<td>Burger design is not unique and seems like an ordinary burger.</td>
<td>Burger design is not very unique or is a mock of an existing burger.</td>
<td>Burger design is creative; however, originality can be pushed more.</td>
<td>Burger design is very creative and is original.</td>
</tr>
<tr>
<td><strong>creative design and recipe that does not exist yet?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ingredients used are not reflective of the culture studied. Not enough research was done.</td>
<td>Ingredients are somewhat unique with only ingredient that are unique to a culture of study.</td>
<td>Ingredients are unique; however, a bit more research could be done to reflect the culture of study.</td>
<td>Ingredients are very unique and reflects the culture of study.</td>
</tr>
<tr>
<td><strong>Are the ingredients of the burger reflective of the culture studied?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Showed poor craftsmanship; evidence of laziness, or total lack of understanding. Work may or may not be glazed.</td>
<td>Showed below average craftsmanship, lack of pride in finished work. Work looks sloppy.</td>
<td>Showed good craftsmanship, with a little more effort, the work could have been outstanding. Glazed was opaque, not enough coats were used.</td>
<td>Artwork was beautifully and patiently glazed; it is as good as hard work could make it.</td>
</tr>
<tr>
<td><strong>How is the student’s craftsmanship with glazing?</strong></td>
<td></td>
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<tr>
<td></td>
<td>Showed poor craftsmanship; form of burger does not look like a burger; incomplete.</td>
<td>Showed below average craftsmanship, burger looks sloppy.</td>
<td>Showed good craftsmanship, with more effort, form could have looked outstanding.</td>
<td>Artwork was beautifully and patiently sculpted; it is as good as hard work could make it.</td>
</tr>
<tr>
<td><strong>How is the student’s craftsmanship with ceramic building?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project is incomplete and was not bisque.</td>
<td>Project is incomplete with bisque ware stage only.</td>
<td>Project is half glazed but not yet ready to be fired</td>
<td>Project is complete at glaze ware stage and turned in on time.</td>
</tr>
<tr>
<td><strong>Is the project complete and turned in on time for presentation/exhibition?</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Appendix C.1 Unit 3 Ceramic Burger Research Guide

Ceramics Burger Research

Circle the country that your group selected to research and create a ceramic burger for.
Turkey  Spain  India  Japan  Brazil  Morocco

Research the menu from McDonalds or Burger King for the country your group selected. Answer the following questions in the table below.

<table>
<thead>
<tr>
<th>What interesting burger can be found here?</th>
<th>What ingredients are used?</th>
<th>Why are these ingredients used?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

For your country, write down 4 popular dishes and the ingredients used that are famous here.
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

What sauces or toppings are commonly found here?
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

What kind of protein are commonly consumed here and why?
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

Using the information you just researched, create a burger that is unique to this region. Create 2 different drawings, label the ingredients, and color the burger accordingly. Use the front and back of this paper.
Appendix C.2 (Quiz 9)

**Quiz 9**

1. Which of the following is used to help smooth works of clay?
   a. Pin Tool
   b. Pear Shaped Loop Tool
   c. Sponge
   d. Cutting Wire

2. Clay that has hardened, no longer has moisture, and not yet fired is called
   a. Pliable clay
   b. Leather hard
   c. Bone dry
   d. Bisque

3. Which hand building technique is best used if the top of the burger bun is round?
   a. Coil
   b. Pinch pot
   c. Slab
   d. Wheel

4. The purpose of a metal rib is to
   a. Carve
   b. Create Designs
   c. Model
   d. Smooth

5. A furnace chamber for firing clay with temperatures ranging from 1100-3600 degrees.
   a. Pot
   b. Glaze
   c. Oven
   d. Kiln

6. Ethnic groups have commingled, more in the past few centuries with the advent of more…
   a. and improved communication technology and travel options
   b. World news outlets
   c. Aerospace technology
   d. Airports

7. Cultural Landscape refers to how humans impact the natural layout of the land. This includes…
   a. Schools, food, customs
   b. Buildings, roads, architecture, and cities
   c. Religion, music, food
   d. culture, language, religion
8. Diffusion is…
   a. The spread of something
   b. Cultural division
   c. Calming of a situation
   d. Depletion of resources

9. People who share biologically transmitted traits that members of a society consider important
   a. Ethnicity
   b. Race
   c. Culture
   d. Cohort

10. The spread of food, music, and art can provide great examples of..
    a. World travel
    b. Variety
    c. Neighborhood commingling
    d. Cultural diffusion
Appendix C.3 (Unit 3 Post-test)

Unit 3 Test

1. Which of the following is one of the world’s most populated regions?
   a. South America
   b. South Asia
   c. South Africa
   d. North America

2. Identify one of the reasons that the majority of humans live between 30 degrees North and 60 degrees North and 30 degrees South and 60 degrees South.
   a. It is close to the Prime Meridian
   b. It is near the largest cities
   c. There are more jobs in that area
   d. The climate is most suitable for human activity

3. Where the soil most is likely to be better for farming...
   a. In a river valley where the river occasionally floods
   b. In a basin
   c. On a mountainside
   d. Below sea level

4. Myles is an aspiring actor. He decided to move from Knoxville, TN to Los Angeles, CA to be closer to the movie industry. Proximity to the movie industry is an example of ...
   a. Push Factor
   b. X Factor
   c. Pull Factor
   d. Balance Factor

5. In 2005, Brown and Williamson Tobacco Company closed its Macon plant after being bought by RJ Reynolds in Winston-Salem. Thousands of families moved to Winston because of this. The plant closing and causing families to move to Winston is an example of a …
   a. Push Factor
   b. X Factor
   c. Pull Factor
   d. Fear Factor

6. Which of the following is NOT an example of a natural resource?
   a. Nuclear energy
   b. Wind energy
   c. Solar energy
   d. Water
7. Which definition is best fit for Non-renewable resources?
   a. a stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively
   b. a natural fuel such as coal or gas, formed in the geological past from the remains of living organisms
   c. Three most basic resources are land, labor, and capital; other resources include energy, entrepreneurship, information, expertise, management, and time.
   d. A nonrenewable resource is a resource of economic value that cannot be readily replaced by natural means on a level equal to its consumption.

8. The world’s most used natural resource is
   a. Coal
   b. Oil
   c. Water
   d. Wind

9. The majority of the world’s population lives in the
   a. Torrid zone
   b. Temperate zone
   c. Polar
   d. Ozone

10. All of the world’s deserts are in the
    a. Torrid zone
    b. Temperate zone
    c. Polar
    d. Ozone

11. The 3 “basic” climate zones are polar, temperate and
    a. Continental
    b. Mediterranean
    c. Torrid
    d. Tundra

12. Ethnic groups have commingled, more in the past few centuries w/the advent of more…
    a. and improved communication technology and travel options
    b. World news outlets
    c. Aerospace technology
    d. Airports

13. The term “Cultural Landscape” refers to how humans impact the natural layout of the land. This includes…
    a. Schools, food, customs
    b. Buildings, roads, architecture, and cities
    c. Religion, music, food
    d. culture, language, religion
14. Diffusion is…
   a. The spread of something
   b. Cultural division
   c. Calming of a situation
   d. Depletion of resources

15. People who share biologically transmitted traits that members of a society consider important
   a. Ethnicity
   b. Race
   c. Culture
   d. Cohort

16. The spread of food, music, and art can provide great examples of..
   a. World travel
   b. Variety
   c. Neighborhood commingling
   d. Cultural diffusion

17. This ethnic religion is predominant in India.
   a. Buddhism
   b. Christianity
   c. Judaism
   d. Hinduism

18. ______________ is the belief in a single deity.
   a. Polytheism
   b. Monotheism
   c. Sikhism
   d. Theology

19. These religions seek to spread their beliefs.
   a. Universalizing
   b. Ethnic
   c. Animism
   d. Gospel

20. __________ is the predominant religion in Israel.
   a. Islam
   b. Judaism
   c. Hinduism
   d. Mormons
21. This is the largest religion in the world.
   a. Islam
   b. Buddhism
   c. Christianity
   d. Hinduism

22. When traveling abroad it is important to know which of the following?
   a. Currency rate
   b. Climate
   c. Customs and traditions of the country you’re visiting
   d. All of the above

23. Muslims worship in a building known as a
   a. Temple
   b. Raab
   c. Palace
   d. Mosque

24. The predominant religious denomination in the Southeastern United States is
   a. Southern Baptist
   b. Methodist
   c. Catholicism
   d. Mormon

25. Which religion forbids the consumption of beef because they believe people are reincarnated when they die and return to earth in the form of sacred cows?
   a. Buddhism
   b. Animism
   c. Shintoism
   d. Hinduism

26. Which of the following stages in ceramics have two sub stages?
   a. Pliable
   b. Green ware
   c. Bisque ware
   d. Glaze ware

27. Leather hard is best defined as…
   a. Clay that has lost a lot of moisture, yet still soft enough to work with.
   b. Clay that has harden, no longer have moisture, and not yet fired/bisque
   c. Clay that has been fired twice with a shiny coating.
   d. Clay that has been fired once and harden.
28. Bisque ware is best defined as
   a. Clay that has lost a lot of moisture, yet still soft enough to work with.
   b. Clay that has harden, no longer have moisture, and not yet fired/bisque
   c. Clay that has been fired twice with a shiny coating.
   d. Clay that has been fired once and harden.

29. Bone dry is best defined as
   a. Clay that has lost a lot of moisture, yet still soft enough to work with.
   b. Clay that has harden, no longer have moisture, and not yet fired/bisque
   c. Clay that has been fired twice with a shiny coating.
   d. Clay that has been fired once and harden.

30. Glaze ware is best defined as
   a. Clay that has lost a lot of moisture, yet still soft enough to work with.
   b. Clay that has harden, no longer have moisture, and not yet fired/bisque
   c. Clay that has been fired twice with a shiny coating.
   d. Clay that has been fired once and harden.

31. Which hand building technique is best used if the top of the burger bun is round?
   a. Coil
   b. Pinch pot
   c. Slab
   d. Wheel

32. Which hand building technique is best use for onion rings?
   a. Coil
   b. Pinch pot
   c. Slab
   d. Wheel

33. Malik is almost finished with his burger. He needs to hollow it out before turning it in to get fired in the kiln. Which tool is best used to make the burger hollow?
   a. Pin tool
   b. Sponge
   c. Loop tool
   d. Wooden rib

34. Tyra completed her burger bun but notices that there are lots of bumps on her burger. The bun is supposed to be smooth and round. Which tool would she use to help even the surface of the bun?
   a. Pear shape loop tool
   b. Metal rib
   c. Wire tool
   d. Pin tool
35. The clay we used is fired at a cone 05. What does this indicate?
   a. We need to fire the clay 5 times
   b. We need to fire the clay for 5 hours
   c. This indicates the temperature range of the clay which is about 2,000 °F
   d. This indicates the temperature range of the clay which is about 20,000 °F

36. Supposed there are two different cones. One is cone 06 and the other is cone 6. Which of the following makes the most sense?
   a. Cone 06 is fired for 06 minutes and cone 6 is fired for 6 hours.
   b. Cone 06 is fired for 6 hours and cone 6 is fired for 6 minutes.
   c. Cone 06 is fired around 2,000°F and 6 is fire around 2,800°F.
   d. Cone 06 is fired around 2,800°F and 6 is fire around 2,000°F.

37. Which of the following stages of ceramics is an example of a physical change?
   a. The clay is soft at first and hardens overtime right before it is fired.
   b. Glazes from the bottles become a glossy surface after heat has been applied to it.
   c. Bisque ware taken out of the kiln and now looks white.
   d. Glaze ware taken out of the kiln and now looks colorful.

38. Which of the following stages of ceramics is an example of a chemical change?
   a. Glazing the artwork.
   b. The clay loses moisture while worked on and starts to look lighter as it dries out.
   c. Ceramic ware taken out of the second fire and the glaze now look shiny.
   d. Adding water to the clay to make it soft again.

39. Which safety regulation explains why a kiln should be placed in a separate room?
   a. The heat from the kiln can cause burns.
   b. Students will keep touching and might spill paint on the kiln.
   c. The noise give students a headache.
   d. The kiln is a normal oven, and anybody can use it; It doesn’t need to be in a separate room.

40. The process of compressing clay together to make it compact, is called
   a. Kneading
   b. Coil
   c. Pinch pot
   d. Wedging

41. What is the purpose of making the burger hollow?
   a. The burger needs to dry out evenly.
   b. The denser (thick) the clay, the faster it will dry out in order for it to be fired.
   c. It looks more aesthetically pleasing (pretty)
   d. We were told NOT to hollow out the burger.
42. Why do we squeeze or compress clay together?
   a. To make it dry out.
   b. To remove any toxic smell from the clay
   c. To eliminate any air bubbles that may cause the clay to explode in the kiln
   d. To make the clay change from gray to white.

43. Andre and Kidane’s group made a Japanese Sakura Burger. They wanted to make the pink burger buns stand out and glazed it HOT PINK. The rest of the burger ingredients are common, thus, they were glazed using pastel (light colors) glaze. This is an example of which principle of art?
   a. Pattern
   b. Movement
   c. Balance
   d. Emphasis

44. Many groups decided to add sesame seeds to their burger bun so that it won’t be a soft bun. This is an example of which element of art?
   a. Line
   b. Rhythm
   c. Texture
   d. Space

45. Deja made a slab of clay (flatten clay) and needed to cut her cheese into a medium sized square. Which of the following tool best serve this purpose?
   a. Sponge
   b. Loop tool
   c. Pinch pot
   d. Metal rib

46. Why should surfaces that touch the table NOT be glazed?
   a. Because this will cause the clay to explode
   b. Because it will get stuck to the kiln and the work would have to be destroyed in order to save the kiln
   c. Because this causes air bubbles to form
   d. This is false because we glaze everything.
47. This is a boxwood.
48. This is a pin tool.
49. This is a metal rib.
50. This is wooden rib.
Appendix C.4 (Unit 3 Reflection)

Unit 3 Reflection: Ceramic Hamburger

For this unit, you created ceramic burger and learned content knowledge from diverse academic disciplines. Answer the questions below to reflect upon what you have learned in this unit.

<table>
<thead>
<tr>
<th>1. Write a brief description of what you created and why it was created. What did we want you to learn and what did you learn?</th>
<th>2. How does this project address art and set it apart from your other classes?? (BE DETAILED)</th>
</tr>
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<tr>
<th>3. <strong>EXPLAIN how</strong> did this project address the elements of art? (FLVCSST) → Color, texture, form</th>
<th>4. <strong>EXPLAIN how</strong> did this project address the principles of art? (BECRUMP) → Unity, Balance</th>
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5. How does this project address geography?
6. STEAM is an acronym for Science, Technology, Engineering, Art and Math. In your opinion, how did this project address science and technology?

| Science: |
| Technology: |

7. Do you think this project made a connection between Art and Geography? **How or Why?**

8. What part of the GAGA project did not seem to go well together? **Explain.**

9. **Propose one** suggestion for this cultural geography unit so that Art and Geography contents can be better integrated?

10. You are asked to make a completely DIFFERENT project for cultural geography. What would you have others do that is artistic and also display their understanding of cultural geography learned in this unit. Be Creative, it does not have to be about food!

11. What is your overall opinion of the project? Did you like it? **Why?**
12. How did you do on your project? What would you change to make it better?

13. How did you like working in groups for this project. What are some challenges you face?

14. What are the benefits of working in a group?

15. Write down the name of each member (including yourself) that is in your group. Complete the scale and questions for each member:
   a. ____________________:
      Terrible group member                      Good                                  Excellent
      0____1_____2____3_____4_____5_____6_____7___8____9____10
      A. What did this member do?
      B. How well did you get along with this group member?
      C. What are some things this member can do to improve their collaboration skills?
   b. ____________________:
      Terrible group member                      Good                                  Excellent
      0____1_____2____3_____4_____5_____6_____7___8____9____10
      A. What did this member do?
B. How well did you get along with this group member?

C. What are some things this member can do to improve their collaboration skills?

<table>
<thead>
<tr>
<th></th>
<th>Terrible group member</th>
<th>Good</th>
<th>Excellent</th>
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<tbody>
<tr>
<td></td>
<td>0_____1____2____3____4____5____6____7____8____9____10</td>
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</tr>
</tbody>
</table>

A. What did this member do?

B. How well did you get along with this group member?

C. What are some things this member can do to improve their collaboration skills?
Appendix D (Unit 4 Midterm Post–test)

Unit 4 and Final Exam

1. In order for us to wear our lantern hat, it must have
   a. Contrast
   b. Color
   c. Form
   d. Movement

2. Unity, form, texture, balance, contrast, shape, emphasis are
   a. The elements of art
   b. The principles of art
   c. The elements and principles of art
   d. The themes of geography

3. Unity, movement, balance, rhythm, pattern, emphasis, contrast are
   a. The elements of art
   b. The principles of art
   c. The elements and principles of art
   d. The themes of geography

4. Ms. Nguyen’s lantern has high contrast because she used complementary colors on hat. Which of the following colors did she used? Think about the mnemonic devices learned in class.
   a. Red and Yellow
   b. Yellow and Purple
   c. Green and Orange
   d. Orange and Purple

5. This lantern festival and holiday is celebrated in Hawaii. Individuals will write down payers and letters to beloved individuals who have passed away.
   a. Loy Kratong
   b. Sky Lantern
   c. Diwali
   d. Floating Lantern

6. The use of repetition in an artwork to create motion is best described as
   a. Movement
   b. Balance
   c. Contrast
   d. Texture
7. Depiction of distance by separating planes through the use of horizon line and manipulation of size.
   a. Space
   b. Size
   c. Grounds
   d. Illusion

8. This type of mark making is best described as using parallel lines to create value.
   a. Gestural
   b. Stippling
   c. Hatching
   d. Cross Hatching

9. This type of mark making is best described as using perpendicular lines to create value.
   a. Gestural
   b. Stippling
   c. Hatching
   d. Cross Hatching

10. The image below uses what type of mark making technique?

![Image of a hand](image)

   a. Gestural
   b. Stippling
   c. Hatching
   d. Cross Hatching

11. Values are best described as
   a. How much an artwork is worth
   b. All the colors of the rainbow
   c. A gradient of light to dark of a particular color
   d. A particular digit of a number
12. How are light values created through the use of mark making with ink/marker?
   a. Place marks closer in proximity
   b. Marks should be made farther away
   c. Marks are randomize, it doesn't matter where marks go
   d. You color white on top

13. Which physics component is associated with the wind against the kite’s surface?
   a. Lift
   b. Drag
   c. Tension
   d. Weight

14. A type of drawing that is done quickly to get the shape, placement, proportion of objects in relation to another.
   a. Blind contour
   b. Cross contour
   c. Gestural
   d. Imaginative

15. The clay we used is fired at a cone 05. What does this indicate?
   a. We need to fire the clay 5 times
   b. We need to fire the clay for 5 hours
   c. This indicate the temperature range of the clay which is about 2,000 ‘F
   d. This indicate the temperature range of the clay which is about 20,000 ‘F

16. N/A

17. Supposed there are two different cones. One is cone 06 and the other is cone 6. Which of the following makes the most sense?
   a. Cone 06 is fired for 06 minutes and cone 6 is fired for 6 hours.
   b. Cone 06 is fired for 6 hours and cone 6 is fired for 6 minutes.
   c. Cone 06 is fired around 2,000’F and 6 is fire around 2,800’F.
   d. Cone 06 is fired around 2,800’F and 6 is fire around 2,000’F.

18. Which of the following stages of ceramics is an example of a physical change?
   a. The clay is soft at first and hardens overtime right before it is fired.
   b. Glazes from the bottles become a glossy surface after heat has been applied to it.
   c. Bisque ware taken out of the kiln and now looks white.
   d. Glaze ware taken out of the kiln and now looks colorful.

19. Which of the following stages in ceramics have two sub stages?
   a. Pliable
   b. Green ware
   c. Bisque ware
   d. Glaze ware
20. Leather hard is best defined as…
   a. Clay that has lost a lot of moisture, yet still soft enough to work with.
   b. Clay that has harden, no longer have moisture, and not yet fired/bisque
   c. Clay that has been fired twice with a shiny coating.
   d. Clay that has been fired once and harden.

21. Bisque ware is best defined as
   a. Clay that has lost a lot of moisture, yet still soft enough to work with.
   b. Clay that has harden, no longer have moisture, and not yet fired/bisque
   c. Clay that has been fired twice with a shiny coating.
   d. Clay that has been fired once and harden.

22. Mandalas have…… balance
   a. Asymmetrical
   b. Symmetrical
   c. Radial
   d. None of the above

23. Mandalas were originally
   a. Printed on blocks
   b. Sculpted
   c. Created with paint
   d. Created with sand

24. Which of the following is a monochromatic?
   a. Dark Blue, Medium Blue, Light Blue, Midnight Blue, Sky Blue
   b. Blue, Blue-Green, Teal, Aqua, Light Blue, Turquoise
   c. Red, Blue, Yellow, White, Black
   d. Blue, Green, Purple, Dark Purple, Light Purple

25. Mandalas have…..balance
   a. Symmetrical
   b. Radius
   c. Asymmetrical
   d. Spiral

26. Which definition is best fit for Non-renewable resources?
   a. a stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively
   b. a natural fuel such as coal or gas, formed in the geological past from the remains of living organisms
   c. Three most basic resources are land, labor, and capital; other resources include energy, entrepreneurship, information, expertise, management, and time.
   d. A nonrenewable resource is a resource of economic value that cannot be readily replaced by natural means on a level equal to its consumption.
27. Ethnic groups have commingled, more in the past few centuries w/the advent of more…
   a. and improved communication technology and travel options
   b. World news outlets
   c. Aerospace technology
   d. Airports

28. The term “Cultural Landscape” refers to how humans impact the natural layout of the land. This includes…
   a. Schools, food, customs
   b. Buildings, roads, architecture, and cities
   c. Religion, music, food
   d. culture, language, religion

29. Diffusion is…
   a. The spread of something
   b. Cultural division
   c. Calming of a situation
   d. Depletion of resources

30. The spread of food, music, and art can provide great examples of...
   a. World travel
   b. Variety
   c. Neighborhood commingling
   d. Cultural diffusion

31. This ethnic religion is predominant in India.
   a. Buddhism
   b. Christianity
   c. Judaism
   d. Hinduism

32. ____________ is the belief in a single deity.
   a. Polytheism
   b. Monotheism
   c. Sikhism
   d. Theology

33. These religions seek to spread their beliefs.
   a. Universalizing
   b. Ethnic
   c. Animism
   d. Gospel
34. __________ is the predominant religion in Israel.
   a. Islam
   b. Judaism
   c. Hinduism
   d. Mormons

35. __________ is the largest religion in the world.
   a. Islam
   b. Buddhism
   c. Christianity
   d. Hinduism

36. When traveling abroad it is important to know which of the following?
   a. Currency rate
   b. Climate
   c. Customs and traditions of the country you’re visiting
   d. All of the above

37. Muslims worship in a building known as a
   a. Temple
   b. Raab
   c. Palace
   d. Mosque

38. The predominant religious denomination in the Southeastern United States is
   a. Southern Baptist
   b. Methodist
   c. Catholicism
   d. Mormon

39. Which religion forbids the consumption of beef because they believe people are reincarnated when they die and return to earth in the form of sacred cows?
   a. Buddhism
   b. Animism
   c. Shintoism
   d. Hinduism

40. Arable land is
   a. Land suitable for growing crops
   b. Surrounded by water
   c. Rich in oil deposits
   d. Mainly found in Canada
41. Deserts encourage human settlement
   a. True
   b. False

42. Rivers discourage travel
   a. True
   b. False

43. Which of the following is not one of the world’s most populated regions?
   a. South East Asia
   b. South Asia
   c. Eastern North America
   d. South America

44. ______ is the average conditions of a region or the weather patterns that occur over many years.
   a. Weather
   b. Climate
   c. Meteorological index
   d. Weather index

45. The biggest factor in determining climate is?
   a. elevation
   b. an ocean
   c. latitude
   d. mountain

46. A tropical climate in the US would be?
   a. Virginia
   b. New York
   c. California
   d. Florida

47. A polar climate in the US?
   a. Virginia
   b. New York
   c. Maine
   d. Alaska

48. Which of these is NOT a factor that determines the climate of a place?
   a. latitude
   b. wind patterns
   c. longitude
   d. elevation
49. Takes millions of years to form.
   a. hydroelectric
   b. renewable
   c. solar
   d. fossil fuels

50. Any useful material found in nature.
   a. natural
   b. alternative
   c. renewable
   d. nonrenewable