

Argumentative Writing “Egg Proj-*chick*.”
A Chick Hatching Unit of Study for Teaching 7th grade Argumentative Writing Skills

By

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Abstract

This project introduces lessons using animal-assisted education techniques as an approach to reengaging students in the classroom. An informal observation of children who were diagnosed with attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) yielded preliminary evidence that the disengaged students began to gain self-control and be more cooperative with others. A more comprehensive examination of this phenomenon seemed to be a worthwhile endeavor, which was the impetus for this project.

The animal-centered unit of study designed by the author is the first-known, formal attempt to utilize the beneficial, therapeutic effects of animals in a non-science, academic unit to maximize learning potential. This project is a compilation of lesson plans that can be used in a unit for 7th graders on argumentative writing using chick hatching as the topic. The persuasive writing unit uses a chick-hatching project as the axis around which its lessons revolve. The aim of the unit is to provide a framework around which data pertaining to children's learning can be collected and analyzed. The Ewing Township District Language Arts Supervisor evaluated the lesson plans and determined that they met Standard W.6.1 in the 2010 Common Core Standards for English Language Arts. It is recommended that research be conducted to determine whether or not there are correlations between the use of animals for academic purposes and the cognitive development of youth.

Table of Contents

Chapter 1: Introduction	1
Background & Setting.....	1
Statement of the Problem.....	4
Project Purpose and Objectives	5
Definition of Terms.....	6
Limitations of the Project.....	8
Basic Assumptions.....	8
Significance of the Problem.....	8
Chapter 2: Review of Literature	11
Background.....	11
Theoretical Framework.....	25
Summary.....	28
Chapter 3: Project Overview.....	30
Methodology.....	30
Instrumentation	32
Project Evaluation.....	32
Chapter 4: Project Outcomes	35
Summary of Outcomes	34
Discussion and Implications	35
Recommendations.....	38
References.....	39
Appendices.....	46

Chapter 1: Introduction

Background & Setting

Research suggests that our educational system is not meeting the needs of our nation's children (Shonkoff & Gardner, 2008; Shonkoff & Phillips, 2000). While our current practices are serving the needs of average and above average students, those with learning difficulties are often left behind. It has also become evident that regular education students who graduate from high school are lacking important cognitive skills that affect their performance in secondary education and their livelihoods (Shonkoff & Gardner, 2008; Shonkoff & Phillips, 2000). One of the foremost authorities on learning styles is Dr. Howard Gardner, whose Theory of Multiple Intelligences changed the way in which people thought about education. In his book, *Five Minds for the Future*, he wrote: “[C]urrent formal education still prepares students primarily for the world of the past, rather than for possible worlds of the future” (Gardner, 2008, p. 17). If we want children to be ready for the workplace, then we need to re-evaluate the way that instruction is taking place so as to engage and affect all learners.

As our society becomes more and more complex, the importance of literacy cannot be overstated. Literacy is defined as the ability to read and write in multiple discourses (Literacy Instruction, 2006). Reading and writing are absolutely critical skills that adults must have to be successful in the workplace. No matter what field one chooses to pursue – police officer, auto mechanic, doctor, public relations consultant, restaurateur, entertainer, artist, professional athlete, or a host of other professions – the ability to read and write well has an impact on one's career (Carnegie Corporation, 2010). If a top athlete or entertainer cannot understand her contract, she could potentially be jeopardizing her future. When an auto mechanic cannot explain in writing what services were performed, people may become skeptical and withdraw their patronage.

Police officers who struggle with writing sequentially and coherently in their reports may not be able to remain employed due to increased exposure of the department to litigation. These are just a few small examples of the necessity of literacy competency in our country.

With no single answer for reforming education, as there are too many variables to consider, what we do know is that a “one-size-fits-all” approach is not one of the recommendations. As per Shonkoff and Phillips (2000), continuing the teaching styles of the past is ineffective, however we must reflect on past practices as a necessary step toward making progress.

In an article written for parents entitled “Writing Well: The Keys to Success,” Dr. Catherine Knott (2011) stated:

Writing well will help your child in almost every school subject, and in reaching major goals in his or her life. As a practical skill, it will enable your child to get and keep jobs, to achieve his or her potential, and to create stronger connections with others, at work and in social activities. Communication turns out to be critical for nearly every human endeavor; in the age of e-mail, frequent travel, and working from multiple sites, well-written communication makes all the difference in how you are perceived by others. Even romance has become more highly dependent on e-mail, messaging, and remote communication. As Cyrano de Bergerac proved centuries ago, good writers often do better in wooing their mates. And as recent studies confirm, good communicators also surpass their peers in keeping their relationships functioning harmoniously (n.p.).

The inability of young people to write clearly and logically is a problem that is plaguing our country. In 2011, 52,200 students across the United States took the National Assessment of Educational Progress (NAEP). The NAEP assessed their argumentative, explanatory, and narrative writing ability. Although the percentages do not add up to 100% due to “rounding”, as

seen in the “NOTE” in Figure 2, the results of the writing assessment are staggering. As shown in Figure 1, 80% of the eighth graders who took the test only earned a score of “Basic” in writing proficiency. The cutoff score for “Basic” was 120, so a student scoring between 120 and 172 fell within that category. Any score between 121 and 172 was considered “Above Basic” [See Appendix A for more in-depth definitions of classifications].

Achievement-level results in eighth-grade NAEP writing: 2011

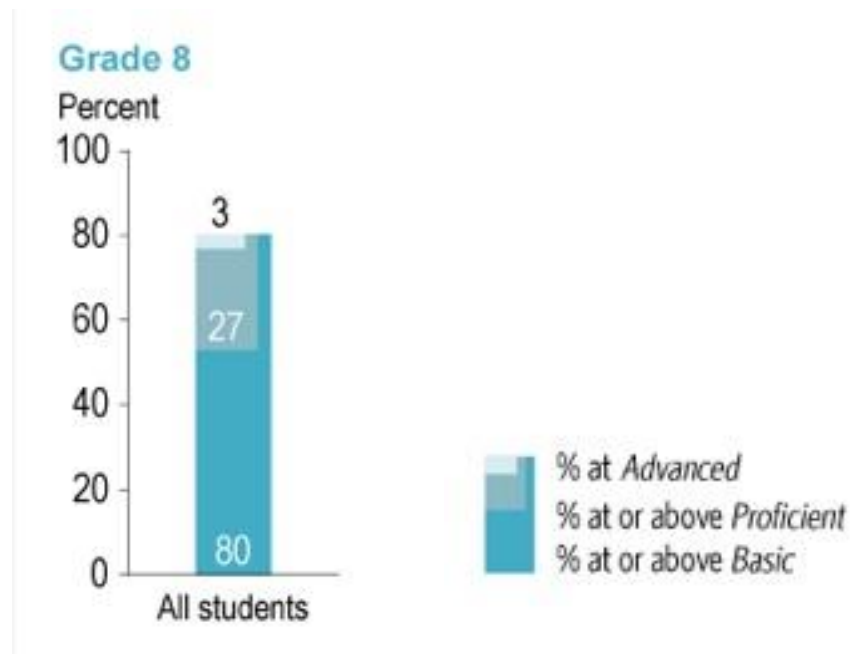
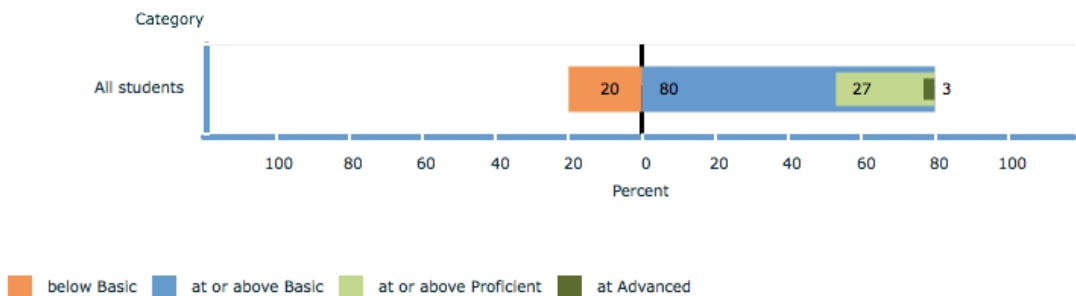


Figure 1. The Nation’s Report Card: Summary of Major Findings

Another 20% of students scored “Below Basic,” which is not indicated at all in Figure 1, however it can be seen in Figure Two. The numbers of basic- or below-basic-scoring students far exceed their “Proficient” counterparts (“The Nation’s Report Card: Summary of Major Findings,” 2011). The results of the NAEP indicate that there is a crisis in our country with regard to writing proficiency among school-aged children. This begs the question – “What should schools be doing differently so as to more effectively teach writing skills?”

Percentages at or above each achievement level for writing, grade 8 by all students: 2011
2011, National



NOTE: Detail may not sum to totals because of rounding. Some apparent differences between estimates may not be statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011 Writing Assessment.

Figure 2. The Nation’s Report Card: Grade 8 National Results

In answer to this query, this project offers an alternative method to teaching writing skills that is grounded in research and sound practice. Its aim is to build a unit of study around a theme - in this case, live animals. A chick-hatching unit is used as a framework within which to effectively teach argumentative writing skills.

Ideally, the new methods would be used for children in grades lower than 8th so as to proactively sharpen their writing skills. This is especially important for this population because having a solid foundation in writing prepares them for the years ahead in which they will have to create long, focused, and detailed research papers and reports. They will also be asked to form complex thoughts, make connections, and analyze and evaluate material throughout their academic career. Strong writing skills are required to adequately convey these sophisticated responses. As such, the target population for this project is regular education students who are between 1st and 8th grade. For this unit of study, I have selected 7th grade students.

Statement of the Problem

There are currently no formal, academic units of study pertaining to writing that use

animals to achieve curricular objectives. It is important to have an academic unit on writing pertaining to animals because children have a natural affinity for living creatures, and their interaction with living things benefits them in countless ways (Faber-Taylor & Kuo, 2006; Melson, 2007). Poresky (1987) conducted a study and found that children who bonded with a companion animal showed positive gains in cognitive development. Pets have also been linked to better language acquisition and enhanced linguistic skills in their young human companions (Edenburg, 2011). The effects of the presence of a dog in the classroom were examined by Hergovich, Monshi, Semmler, and Zieglmayer who found that it factored significantly in the cognitive and social development of children (2002).

This project offers the first argumentative writing lesson plans that utilize the concept of animal-assisted education. It provides opportunities for formal assessment and data collection that can be used to gather information about whether or not animals have a positive effect on children's cognitive development.

Project Purpose and Objectives

The purpose of the project is to offer a non-traditional, animal-centered writing unit of study, which can be used as an alternative method to teaching writing skills – more specifically, compositional elements of argumentative essays.

The project is guided by the following objectives constructed from Standard W.7.1 in 2010 Common Core Standards for English Language Arts. It is the only standard that addresses argumentative writing.

- CCSS.ELA-Literacy.W.7.1a - Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
- CCSS.ELA-Literacy.W.7.1b - Support claim(s) with logical reasoning and relevant

evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

Definition of Terms

AAA – Animal-Assisted Activities: “structured opportunities for motivational, educational, recreational, and/or therapeutic benefits to enhance quality of life. AAA are delivered in a variety of environments by specially trained professionals, paraprofessionals, and/or volunteers, in association with animals that meet specific criteria" (Pet Partners).

AAT – Animal-Assisted Therapy: "AAT is a goal-directed intervention in which an animal that meets specific criteria is an integral part of the treatment process. AAT is directed and/or delivered by a health/human service professional with specialized expertise, and within the scope of practice of his/her profession. It is designed to promote improvement in human physical, social, emotional, and/or cognitive functioning [cognitive functioning refers to thinking and intellectual skills]. AAT is provided in a variety of settings and may be group or individual in nature. This process is documented and evaluated" (Pet Partners).

ADHD – Attention Deficit Hyperactivity Disorder: Those diagnosed with attention deficit hyperactivity disorder (ADHD) typically have a difficult time focusing, are overactive, are not able to control behavior, or a combination of these. To be diagnosed as ADHD, the individual’s behaviors must be out of the normal range for a person's age and development (Klass, 2013).

Biophilia - the theory that human beings have a biological predisposition to deeply affiliate with nature (Ungar, 2005).

Common Core State Standards - The Common Core State Standards provide a consistent,

clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers (“Common Core State Standards Initiative,” 2012).

Experiential Education - a philosophy that informs many methodologies in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills, clarify values, and develop people's capacity to contribute to their communities (Association for Experiential Education, 2013)

Fluency - In any piece of writing, there are many possible ways to write any sentence correctly, but usually, of those correct versions, one or two will sound better than others. A writer who can pick out those versions and can use them frequently will have a strong sense of sentence fluency. This does not mean creating longer sentences, but means using long sentences when they would be best and short sentences when they would suit better. It means creating a sense of rhythm with the sentences and a flow that the reader finds enjoyable to follow along (Literate Learner, n.d.).

Literacy – the ability to read and write in multiple discourses

Oppositional Defiant Disorder (ODD) - an ongoing pattern of defiant, uncooperative, hostile behavior toward authority figures that seriously interferes with ones’ day to day functioning (Oppositional Defiant, 2011).

Reciprocal Determinism – a social cognitive theory constructed by Albert Bandura based on the premise that behavior, cognition, and environment interact to shape behavior (McGraw Hill, 2002).

Risk - Risk refers to an attempt by an author to do something interesting, engaging, and unusual

with his or her writing; Using similes, metaphors, dialogue, and rhetorical questions would constitute compositional risks.

Self-efficacy- one's perception of his or her capability to perform a behavior or action (Pollok, 2002)

Voice - Voice is the personality of the writer coming through on the page. It is what gives the writing a sense of flavor, a uniqueness, and give the reader the feeling that the writer is talking directly to him or her. A strong sense of voice demands that the writer make a commitment to the writing and write honestly with conviction (Literate Learner, n.d.).

Limitations of the Project

This project is limited because it only addresses one subject – writing – and one grade level; therefore, the outcomes of the project are not generalizable. It is also possible that certain school districts will not permit animals of any kind in the classroom, in which case a virtual chick-hatching project may be used as a substitution. Further, these lesson plans only address baby chicks in the classroom, as opposed to other types of animals that could have been used.

Basic Assumptions

It can be assumed that the curriculum writer is qualified to develop lessons on the subject using state standards. Furthermore, it is assumed that the teacher assessing the lessons is certified and has prior experience teaching argumentative writing to 7th graders and can accurately assess the lesson plans.

Significance of the Problem

As educators, it is our responsibility to explore any and all instructional techniques that can result in higher levels of engagement and improved academic performance for my students. Harvard University's National Scientific Council on the Developing Child has recommended

that new intervention strategies be developed for students whom our current educational system is failing (Science-based Framework, 2007). Although there is very limited data on the effects of animals on cognitive development, the available information is intriguing and worth a closer look.

Students who do not succeed in the classroom tend to exhibit behavior issues and vice versa (Tremblay et al., 1992; Blair & Diamond, 2008; Morrison & Cooney, 2002; Lonigan et al., 2000). Skills such as independence, impulse control, directed attention, organization, task persistence, and flexible thinking have been shown to lead to active and efficient learning, and they are known as learning-related skills (Howse, Lange, Farran, & Boyles, 2003). Students who are able to increase these competencies have been shown to make immediate improvements in their levels of achievement (Matthews, 2010); therefore, it can be hypothesized that social behaviors and academic performance go hand-in-hand.

Animal-centered academic units of study, such as the one put forth in this project, would be a good starting point to explore animals' effects on children's cognitive development. As expressed by Strunk and White (1918) almost a century ago: "Fortunately, the act of composition, or creation, disciplines the mind; writing is one way to go about thinking, and the practice and habit of writing not only drain the mind but supply it, too" (p. 100). In other words, clear thinking leads to clear writing (Clear Thinking, 2003). If animals can help children with their thinking, then they can also assist with their writing.

This project is a compilation of lesson plans that can be used in a unit for 7th graders on argumentative writing using chick hatching as the topic. It is the first documented attempt at animal-assisted education (AAE) wherein the animals serve as a framework within which

students are taught specific objectives related to the craft of argumentative writing. The author designed the unit for 7th grade regular education students.

Chapter 2: Review of Literature

Background

Research suggests that our educational system is not meeting the needs of our nation's children (Shonkoff & Phillips, 2000). Its ineffectiveness may be due, in part, to a dogmatic adherence to traditional, one-dimensional teaching methods, which rarely incorporate nature or animals.

Children have a natural affinity for animals, and their interaction with living things benefits them in countless ways (Faber-Taylor & Kuo, 2006; Melson, 2007). Humans, in general, are thought to be *biophilic* - that is, possessing intrinsic adaptations that make them attentive to nature. It is purported that this tendency is rooted deeply in Homo *sapien* DNA as a necessity for survival. Even babies have clearly preferred live animals to toy versions, and being in the presence of dogs, cats, and rabbits made them more verbal and more engaged. In a study with two- to six-year-olds, 80% of the children completely ignored realistic stuffed animals in favor of a cockatiel, a tarantula, a dog, and a rabbit (Melson, 2007). This proclivity correlates with Jean Piaget's assertion about the elements that are necessary to promote optimal learning: brand-new information, topics or items that provoke curiosity, and "breaks" from the ordinary (Piaget, Gruber, & Voneche, 1977). Animals tend to be powerful motivators for learning because they easily fulfill these three elements.

One of the leading theorists in the area of children's cognitive development is Howard Gardner. His theory of multiple intelligences revolutionized the ways that educators viewed the process of instruction, although his ideas are not always put into practice. Gardner's theory is rooted in the belief that individuals have varied natural tendencies, which they can develop and contribute to society. People are thought to be able to recall information, demonstrate

knowledge, and comprehend in multiple ways according to Gardner. He has elucidated this notion:

“We are all able to know the world through language, logical-mathematical analysis, spatial representation, musical thinking, and the use of the body to solve problems or to make things, an understanding of other individuals, and an understanding of ourselves. Where individuals differ is in the strength of these intelligences - the so-called profile of intelligences -and in the ways in which such intelligences are invoked and combined to carry out different tasks, solve diverse problems, and progress in various domains”
(Gardner, 1991, p. 12).

The contention that individuals have various intelligences and that they can contribute to society in different ways was an idea that had never before been so fully developed and explained.

Gardner defined the intelligences as follows:

- Linguistic intelligence encompasses spoken and written communication, the ease of ability to learn languages, and the ability to use communication to succeed. This intelligence highlights people who can write well and express themselves through poetry and oratory.
- Logical-mathematical intelligence includes the ability to decipher logistical problems and perform mathematical operations. This intelligence includes the ability to find patterns, use reasoning abilities, and think logically.
- Musical intelligence encompasses the gifts of composition and appreciation of musical patterns. Those who are musically inclined can recognize and are fluent in musical pitches, tones, and rhythms.

- Bodily-kinesthetic intelligence deals with using one's body to be productive and solve problems. It is using cognitive abilities to coordinate locomotor movements. Gardner believes mental and physical activities are related.
- Spatial intelligence pertains to the ability to perceive and utilize patterns in wide-open spaces, as well as small, specific areas.
- Interpersonal intelligence deals with the ability to perceive and comprehend the needs and motivations of other people. It enables people to come together and be productive
- Intrapersonal intelligence entails the ability to understand oneself - to have an appreciation of feelings, concerns, and motivations that one experiences. Howard Gardner sees it as being able to use this vital information to navigate our lives and be productive.
- Naturalist intelligence bespeaks a sensitivity to living things and features of the natural world.

Gardner maintained that the intelligences rarely operate independently. They are used at the same time and tend to complement each other as children develop skills or solve problems. He stated that, “The theory is an account of human cognition in its fullness (Gardner 1993).” Essentially, Howard Gardner redefined how we think about thinking.

Children in elementary schools are often provided with opportunities to explore and develop the first eight intelligences in the classroom and in “specials” such as library, computer, music, art, and physical education. The naturalist intelligence, however, is frequently neglected as a method of facilitating cognitive development.

It is important for teachers to incorporate non-human creatures into instructional methods in order to reach children for whom traditional methods are not working. There have been very

few studies done about the effects of animals on learning; however, the ones that have been conducted yielded positive results. In a study by Poresky (1987), it was discovered that children who bonded with a companion animal showed positive gains in cognitive development. Further, pets have been linked to enhanced linguistic skills and better language acquisition in their young human companions (Edenburg, 2011). Hergovich, Monshi, Semmler, and Zieglmayer examined the effects of the presence of a dog in the classroom and found that it factored significantly in the cognitive and social development of children (2002).

Research has also shown that using animals in instruction is effective because children become emotionally invested, which results in better learning and retention of the subject matter. Further, students achieve at their highest level when learning “occurs within meaningful relationships” (Edenburg, 2011). Genetic epistemologist and psychologist Jean Piaget is well known for his research on children’s cognitive development, and he had a strong influence on Howard Gardner, as well. He believed that there were three elements that catalyzed learning in children: brand-new and interesting information, mild departures from preconceived thoughts and ideas, and things that inspired wonderment (Piaget, Gruber, & Voneche, 1977). The predictable unpredictability of animals makes them perfect “assistants” in the classroom. As such, exploring new instructional methods that incorporate animals would not only tap into students’ naturalist tendencies, but it would also serve as a powerful motivator to expedite knowledge acquisition.

Literacy Achievement: Assessing the Gaps

The state of public education in the U.S. is at a crossroads. In 2009, the number of students who dropped-out of schools across the nation reached a staggering 1.2 million. In fact,

the data were so disheartening that the U.S. Department of Education commissioned ten advisory groups to research the problem (Thompson, 2011).

With the passing of the “No Child Left Behind” Act of 2002, states were required to design curriculum and administer standardized tests each year. They began to be held accountable by the federal government for student performance, and annual report cards – broken down into various subgroups - are made public (Payne-Tsoupros, 2010). As a result, glaring trends and disturbing discrepancies became apparent that may otherwise have gone unnoticed. One such fact is that children’s achievement in Language Arts has been positively linked to higher socio-economic status (SES) (Podlesek & Levpuscek, 2012; Kayiran & Karabay, 2012; Waters 2011, Hartas, 2011), which does not bode well for students living in lower-income areas. African-American children, particularly boys, are underperforming when compared to their white counterparts (Matthews et al. 2010; Jencks & Phillips, 1998; Lee, 2002; Fryer & Levitt, 2004). However, it is important to note that SES negatively affects children across race and gender lines (Entwisle, Alexander, & Olson, 2007).

Children’s overall academic success can often be positively correlated to successful development of literacy skills (Pressley, 2002; Lonigan, Burgess, & Anthony, 2000; Whitehurst & Lonigan, 1998). It has been well established that students who gain a solid foothold early on in reading and writing will also continue to make strides in other academic subjects such as social studies, math, and science. On the other hand, children who struggle academically sometimes engage in “disruptive behavior” in their early academic careers (Tremblay et al., 1992) because they lack self-regulation skills (Blair & Diamond, 2008). The opposite could also be true, in which case children exhibiting aggressive or impulsive behaviors begin to develop academic deficiencies. Masten and colleagues completed a long-term, longitudinal study of 12,385

children, which revealed that externalized behaviors subvert adaptive academic functioning and result in poor teacher and peer relationships (Masten, 2005). Regardless of which came first, once students reach their early teens, these tendencies can lead to “delinquent personality” (Tremblay et al., 1992), which is strongly correlated to academic failure (Hinshaw, 1992). Well-structured programs have been shown to have a positive impact on children’s emotional and social development, as well as academic performance (Blair & Diamond, 2008). If animal-centered units improve students’ cognitive development, which results in better behavior, teachers can use units like the “Egg Proj-chick” as quality instructional tools.

In a study done at Harvard University’s “Center on the Developing Child,” the National Scientific Council on the Developing Child found that quality instruction actually promoted the development of new synapses in developing brains (“Science-based Framework,” 2007). This gives children the solid foundation they need for a lifetime of learning. The 2006 Proceedings of the National Academy of Sciences indicated that sophisticated thinking capability is built directly upon basic cognitive functions in a hierarchical fashion (Nudsen, Heckman, Cameron, Shonkoff, 2006). Well-crafted, experiential, animal-centered lessons have the potential to bolster students’ basic skills, thus potentially triggering a reversal of the negative trend we are currently seeing in Language Arts. Improving students’ performance in this area can mitigate disruptive behavior and lead to the development of self-regulation skills. As such, fewer teens would develop “delinquent personality” and more could experience academic success. This can only benefit the students, their families, the school, and the community as a whole.

Based on a thorough analysis of relevant, current literature, it is clear that there is a need for further research on Language Arts units of study that engage the pre-teen student. This age represents a critical stage in a child’s academic development. The text *Community Programs to*

Promote Youth Development states that during adolescence, “rates of school disengagement and school failure in the United States increase” (p. 48). It goes on to say that the changes that take place in a child’s early tween and teen years have the potential to snowball into problems leading to prison, pregnancy, and dropping out of school. These results seriously compromise a young person’s future.

When Erik Erikson’s 8 Stages of Development are considered, it becomes clear that some children have negative experiences in school during the “Industry vs. Inferiority.” These experiences profoundly shape the child’s attitude and personality, potentially setting the stage for failure in the next four stages. The fact that “Identity Achievement vs. Role Confusion” succeeds “Industry vs. Inferiority” could provide insight as to why teens develop dangerous and/or counter-productive tendencies during these years (McLeod, 2013).

In the article “What’s Wrong with the Teenage Mind” (2012), Gopnik pointed out that negative experiences in childhood actually alter brain chemistry and its neural pathways. However, it also offers evidence that hope is not lost. Providing different, positive, sustained stimuli can actually help to create new connections to the prefrontal cortex, resulting in the greater impulse control and yielding better, safer, and healthier choices. This underscores the importance of early intervention for at-risk youth and the institution of academic programs that are dynamic, effective, and well-rounded. As indicated in *Community Programs to Promote Youth Development* (2002), a well-rounded program addresses the teens’ educational, physical, cognitive, social, emotional, and career-based needs, and it must evolve with the youth as they age.

Unfortunately, children who have difficulty acquiring literacy skills are at a higher risk for developing social issues, deviant behavior, and dropping out of school, in addition to several

other social and academic problems (Morrison & Cooney, 2002; Lonigan et al., 2000). With each passing year, the literacy issues will continue to amplify in their intensity (Fryer & Levitt, 2005), thus increasing the likelihood that social issues will compound the situation.

Clearly, it is time to begin thinking of innovative new ways to engage all students in the learning process so that they can improve and strengthen their literacy skills. Well-structured, early intervention programs have been shown to have a positive impact on emotional and social development, as well as academic performance (Blair & Diamond, 2008). In a study done at Harvard University's "Center on the Developing Child," the National Scientific Council on the Developing Child found that quality instruction actually promoted the development of new synapses in developing brains (Science-based Framework, 2007). The 2006 Proceedings of the National Academy of Sciences indicated that sophisticated thinking capability is built directly upon basic cognitive functions in a hierarchical fashion (Nudsen, et al., 2006). This gives children the solid foundation they need for a lifetime of learning.

Animals Benefit Human Health

Research has shown that aquariums and the mere presence of a dog have been proven to lower blood pressure and calm anxiety in both adults and children (Baun, Otetting, & Bergstrom, 1991; Pichot & Coulter, 2007). Studies also suggest that animals can make people less withdrawn and more responsive. Simple observation of a fish tank has been documented as lowering the systolic and diastolic blood pressure rates of both hypertensive and non-hypertensive people. An analysis of the data suggests that watching fish induces a state of relaxation (Beck & Katcher, 1996).

Beck and Katcher (1996) conducted a famous study of 92 patients who suffered from severe heart disease. They found that people who had pets of any kind survived longer than

people without. The researchers wondered if the dog owners' statistics positively affected those of the entire group because of the extra cardiovascular exercise they received from dog walking. As a "double-check," the researchers narrowed the focus exclusively to patients who owned a pet other than a dog. Their results were the same - the mortality rate of those who had a pet was a third that of people without pets.

In another study involving children, they were asked to read aloud and their blood pressure was measured as an indication of anxiety. Those participants who read to the researcher in the presence of a dog had lower blood pressures than those who read to the researcher with no dog in the room. Further, the children who saw the dog when they first entered had the lowest blood pressure of all, which suggests that the initial sighting of the dog prompted them to feel safe in the situation (Beck & Katcher, 1996).

From the most minimal contact with nature, such as looking out a window, to the greater commitment of owning a pet, people of all ages benefit psychologically, physiologically, and mentally by experiencing nature. In fact, the benefit is often disproportionately higher than the amount or degree of exposure. This is consistent with the finding that when given a choice between a window with a view of water or a landscape versus one that overlooks a non-natural setting, people routinely opt for the former (Ungar, 2005). If the mere observation of animals and nature results in tangible health benefits, then it is reasonable to infer that physical interaction with them can also have a powerful positive effect.

An Animal-Centered Approach: Animal-Assisted Education

Academic programs utilizing animals can be designed that help children build self-regulatory behaviors, acquire higher-order thinking skills, and experience academic success. In fact, some schools across the country already use therapy dogs that come into classrooms with

their owners. Non-readers suddenly vie for opportunities to read to these canines, and studies have shown that these children quickly increase their reading comprehension skills, sometimes as much as 2-4 grade levels (Kaymen, 2005). Researchers have observed that exposure to nature improves the cognitive development of young people by improving their reasoning, awareness, and observational skills (Pyle, 2002), while also helping to develop creativity, observational skills, and foster a sense of peace (Crain, 2001).

The works of several motivational theorists were used as a foundation upon which to increase student motivation by way of a live-animal-centered unit of study. Motivation is thought to be a collection of beliefs, perceptions, values, interests, and past experiences that cause an individual to engage in an activity. Wide arrays of factors influence motivation and degrees of motivation (Wakefield, 1996). Human beings are all very different, and as such, they are motivated by different stimuli. Taking into consideration the special uniqueness of each student; that which would nurture motivation in one child may not have any effect on another. Students traditionally enter formal school at age five with a high degree of motivation to be active and healthy (Lumsden, 1994). In reading and writing, studies show that the motivation to engage in these activities for enjoyment lessens with age (Broussard & Garrison, 2004; Guthrie, 2000).

Researcher Carole Ames stated that motivation to learn is characterized by long-term, quality involvement in the educational process and an individual's commitment to the process of learning (Ames, 1990). Literature suggests that each child's motivational past comes with him or her into each new learning experience. Teachers in each case should think of themselves as agents able to stimulate student motivation to learn (Brophy, 1987). The environment in any place of learning is of paramount importance. If the child feels she or he is in a safe, caring, supportive place where there is a sense of unity and that everyone is special and respected, they

will be more apt to fully engage in the educational activity and the process. In the article “What’s Wrong with the Teenage Mind,” it stated: “Our social and cultural life shapes our biology” (Gopnik, 2012). If this is true, then providing positive experiences in school can help to neutralize (although not eliminate) negative ones that have occurred. The brain’s physical structure can literally be altered to “encourage long-term planning and delay gratification” (Gopnik, 2012). As such, positive, engaging academic programs are absolutely critical for sound psychological, physical, social, and cognitive development.

Bonding with another living creature can have a profound, positive effect on a young person, as children tend to love animals. In one 6-month study, children who participated in a companionable animal program had improved attendance, behavior, and rate of retention over those who did not (Fawcett & Gullone, 2001). In another study, pre-teens who had a history of abusing people and/or animals were enrolled in a program called the “Shiloh Project.” The assistant director of the Boys’ Probation Home described these children as, “...pretty hard guys who have committed some serious crimes.” At the beginning of the program, the youth were paired with shelter dogs that desperately needed obedience training. The young adults were tasked with training their dog to follow basic commands at the end of the 3-week period. Very often the boys became so emotionally attached to the canines that they were inspired to write and recite poetry at their graduation ceremony. Nancy Katz, the founder of the Shiloh Program said, “Here are these tough guys and they get up there and read these sappy poems about how much they love their dogs.” Clearly, this study indicates that the physical handling of and emotional attachment to an animal can inspire even the most behaviorally challenged child to write with passion and emotion (Melson, 2001).

In addition to behavioral issues, many students struggle with attention-deficit/hyperactivity disorder, also known as ADHD. A recent article in “TIME Magazine” states that 11% of our nation’s youth between the ages of 4 and 17 have been diagnosed with this disorder and that one-in-five boys is afflicted (Park, 2013). A group of researchers set out to study the effects of animals on children with ADHD. They took 50 students who had an attention-deficit/hyperactivity disorder diagnosis and randomly assigned them to either an Outward Bound Program (control group) or a Companionable Zoo Animal program (CZA) for 6 months. Students in CZA were taught how to care for and hold the pets that they chose as “their own.” There were also 21 other optional activities the children could do such as charting the creature’s growth, calculating bedding and food requirements, breeding, and teaching others about their pet. These additional learning tasks were purposefully designed to mimic the subjects at school that the children had learned to associate with failure and avoidance. The results of the study showed that the children’s attention was held longer and attendance was higher in CZA as opposed to Outward Bound. The majority of students also completed an average of 8 of the 21 extra tasks even though no special credit or reward was given (Beck & Katcher, 1996). They were inspired by their pets and purely driven by intrinsic motivation. Taylor also corroborated this study, finding that children with ADHD were able to concentrate better after contact with nature (2001).

Based upon the number of restraints children were requiring in a school setting, the researchers anticipated approximately 35 during the six month study. However, no child in the CZA group had to be restrained at any time. As such, the visits to the zoo and interaction with pets could be perceived as having a calming effect on the participants. Instructors completed an Achenbach scale to rate behavior, which showed that “[A]nimal-assisted therapy and

education can have a large, persistent, and broadly therapeutic effect on highly aggressive, emotionally disturbed children and adolescents with severe learning difficulties.” The data revealed a decrease in aggressive and impulsive behavior, improved cooperation with teachers, enthusiasm and higher levels of engagement with learning, and better self-control that carried over to their regular school classes (Beck & Katcher, 1996).

There has been limited research on the social-emotional effects of animals on children in the classroom, however those that have been conducted show that the very presence of a non-human creature has a positive effect (Gonski, Peacock, & Ruckert, 1986). Gonski, Peacock, and Ruckert observed that, in an interview, dogs elicit more open, cooperative behavior from children who were classified as “juvenile delinquents” (1986). Further, Davis concluded that it is easier for youth with emotional disturbances to connect with animals than people (1986). This was corroborated by Nebbe whose study showed animals to be effective liaisons between “difficult children” and adults in the classroom (1991). Thus, it is reasonable to conclude that an animal in the classroom would improve the social-emotional climate, particularly for children with behavioral or communicative issues.

It is likely that animals are effective motivators for learning because if students are emotionally invested in the subject about which they’re learning, comprehension and retention are evident (Hatano & Inagaki, 1993). Although there have been many studies on the effects of animals on child development, very few have investigated the area of cognition. One study by Poresky suggested that there is, in fact, evidence that cognitive development can improve when children bond with an animal (1987).

Theorists have come to the conclusion that both hands-on and observational experiences with animals have a positive effect on the affective, evaluative, and cognitive development of

youth (Altman & Wohlwill, 1978; Derr, 2001; Kaplan & Kaplan, 1989; Kahn, 1997, 1999; Kellert, 2002; Nabhan & Trimble, 1994; Ratanapojnard, 2001; Sobel, 1993). Programs such as animal-assisted therapy (AAT) and animal-assisted activities (AAA) have also proffered evidence that contact with animals contributes to a child's emotional, social, physical, and cognitive development (Faber-Taylor & Kuo, 2006). AAT is generally administered by a certified provider, and it has very clear objectives that serve as goals. Nathanson found that when using AAT, the concentration ability of people with learning disabilities improved because they had an interest in the dolphin they were studying. In this instance, the dolphins facilitated the learning process, which was found to be somewhere between two- and ten-times more effective than more conventional approaches to therapy (1998). AAA, on the other hand, is recreationally based and there is no specific treatment plan (Edenburg & van Lith, 2011). Thus, an environment that combined "positive, engaging academic programs" with AAA or AAT could potentially yield one in which optimal learning can occur. This would create a new and dynamic program: AA"E" – animal-assisted education. Lepper & Cordova (1992) suggest that the personalization of education, during which an activity is associated with characters and objects of inherent interest to the students, increases intrinsic motivation. Thus, one can conclude that if students are interested in the animals, their desire to participate in the lessons will be strengthened, which can lead to improved academic performance and behavior.

After taking the aforementioned characteristics and variables into consideration, it becomes apparent that the creation of an animal-centered Language Arts unit of study can offer educators and researchers an opportunity to examine animals' effects on children's motivation, writing skills, and/or cognitive ability in a quantifiable way. This could pave the way for

additional novel instructional programs to be created that can help more students to experience academic and behavioral success.

Theoretical Framework

B.F. Skinner's motivational theory is built on the premise that positively reinforced behavior in individuals will reoccur and that intermittent reinforcement is somewhat effective. This stimulus ideally should be given in tiny amounts so that the responses can be reinforced. This practice is referred to as "shaping" (1953). Well-crafted educational lessons involving animals can help to reshape a reluctant learner's attitude about academics. By keeping the student engaged longer, the animal helps to facilitate more opportunities for a child to succeed, thus increasing self-efficacy.

One's perception of his or her capability to perform a behavior or action is known as "self-efficacy" (Pollock, 2002). In contrast to self-concept or self-esteem, self-efficacy is task or situationally specific, rather than generalized notions about one's abilities (Barnyak & McNelly, 2009). These perceptions are typically based upon past experiences with similar tasks (Pajares & Shunk, 2001). Highly self-efficacious people are more likely to challenge themselves, set high goals, and have greater persistence at achieving those goals (Barnyak & McNelly, 2009).

Albert Bandura examined self-efficacy from a psychological standpoint and determined that it was socially constructed; that is, it is a learned behavior. As such, the behavior can be *unlearned*, in a sense, and new, more positive attitudes can take its place. Positive interventions can instill new beliefs that change the course of students' lives (Bennett-Conroy, 2012), which correlates directly with Bandura's model of Reciprocal Determinism. This term refers to the idea that the interaction among one's environment, thought processes, and actions determine whether or not a specific behavior will be repeated. Thus, positive feedback will increase the likelihood

that the attitude or action will continue (McGraw Hill, 2002).

In a study by Brophy, confidence was shown to increase when a task was completed with competence (1987). So, with each success, the student will likely want to continue engagement in the lesson. When a learner has success in his or her environment, the motivation is positive, and the student will want to repeat and continue the activity and stay in the environment (White 1959). Thus, Skinner and Brophy's philosophies would provide a solid framework on which to build an animal-centered writing project. They have demonstrated that children's behavior can be reshaped and that motivation can lead to higher levels of engagement. Since animals have been shown to increase children's motivation, attention-span (Edenberg, 2011), and performance of cognitive tasks (Gee, 2012), it would stand to reason that argumentative writing lessons involving animals could positively reshape attitudes, keep the child engaged longer, and result in increased academic success.

On the whole, children are intellectually stimulated and motivated by companion animals (Melson, 2003). The most general principle determining whether increased motivational appeal will also lead to increased learning concerns the match between the actions required for students to learn the activity and the actions required for students to enjoy that activity. When these actions are the same - or if they are dependent on each other - the effects on learning should be positive. When these actions are separate, the effects on learning should be negative (Lepper, 1987). Students studied on the elementary school level stated that 'having fun' is the main reason for their continued participation in lessons or activities. The feeling of experiencing enjoyment for young people is enough to keep them going (Wankel & Sefton, 1989). Spring-boarding off this research, it is salient to note that Baun, Oetting, and Bergstrom found that even looking at mere *photos* of an animal was associated with increased feelings of enjoyment in children, and

interaction with them had an even greater effect (1991). Thus, if: (1) interacting with animals contributes to children's enjoyment; (2) enjoyment contributes to continued participation in an academic lesson; and (3) continued participation leads to improved academic performance, then we can conclude that (4) interaction with animals will lead to improved academic performance in children.

Howard Gardner's theory of multiple intelligences offers the next building block for such a unit of study. He suggested that there are many ways to engage children, one of which is by utilizing the naturalist intelligence (Gardner, 1991). This complements the idea of *biophilia* – the theory that human beings have a biological predisposition to deeply affiliate with nature (Ungar, 2005). Although the idea of biophilia is relatively new, people from across the globe and spanning countless decades have long believed that being a part of nature is an essential part of physical emotional and spiritual wellness (Besthorn & Saleebey, 2004). Tapping into the “nature intelligence” within children can trigger their neurons to process information more efficiently. According to Ungar, “The foundation idea of this ecological-evolutionary perspective is that current neural capacities and response patterns have evolved as a result of past species responses to environmental contingencies” (2005). Research has indicated that the stimulation of children's brains can actually change its physical structure, thus creating new behaviors (Gopnik, 2012). An “argumentative writing” unit of study centered on animals has the potential to capture the interest of “natural” learners, trigger and satisfy innate biophilia, and positively alter a child's mind and behavior.

The aforementioned theories have guided the creation of the “Egg Proj-*chick*” by providing a framework for children's motivation, behavior, levels of engagement, learning

styles, and biophilic tendencies upon which an “Argumentative Writing” unit involving animals can be structured.

Summary

Children have an innate inclination toward animals (Faber-Taylor & Kuo, 2006; Melson, 2007). Non-humans’ “predictable unpredictability” serves as a captivating motivator, which creates unique opportunities for learning to take place. Leading educational theorist Howard Gardner outlined various approaches to learning, one of which is a nature-oriented. The more “intelligences” educators tap into, the more learners they will reach (Gardner, 1991). Those who support the concept of biophilia, an innate need people have to associate with nature, suggest that many people possess a proclivity toward nature-learning (Ungar, 2005); thus, if teachers can incorporate it into their instructional practices, they can increase the effectiveness and retention of their lessons for children. Animals inspire emotional investment in children because they provide meaningful relationships within which the highest levels of learning can take place (Edenburg, 2011). As “teaching assistants,” living things can help educators “tap into” naturalistic and biophilic tendencies and expedite knowledge acquisition.

Literacy, specifically the ability to write clearly and logically, is a topic of concern in the United States, and it is substantiated by the poor results of the 2011 NAEP writing test (The Nation’s Report Card: Summary of Major Findings, 2011). African-American children, as well as those with low socio-economic status, are particularly at-risk for not adequately developing their writing skills (Matthews et al. 2010; Jencks & Phillips, 1998; Lee, 2002; Fryer & Levitt, 2004). Poor performance is then linked with behavioral issues that become more serious as the child ages (Masten 2005).

If teachers can engage students in the learning process, that engagement can lead to improved academic performance. New intervention strategies are required to reach reluctant or disinterested learners (“Science-based Framework,” 2007). Lessons and techniques that incorporate animal-centered units of study are a possible solution for learning, and thus behavior, issues. If animals promote engagement and motivation leading to increased cognition, this can improve their writing ability (“Clear Thinking,” 2003).

Animals have already been proven to benefit adults and children physically, socially, emotionally - especially in the areas of AAT and AAA. There are well-documented studies that show a decrease in blood pressure (Baun, Oetting, & Bergstrom, 1991; Pichot & Coulter, 2007), improved health, better verbal acuity (Beck & Katcher, 1996), the promotion of self-regulatory behaviors (Pyle, 2002), increased motivation to learn (Beck & Katcher, 1996), and better attendance / rate of retention (Fawcett & Gullone, 2001).

The principles of Skinner and Brophy’s theories of motivation and engagement, respectively, provide a solid framework on which to build an animal-centered writing project. They have demonstrated that children’s behavior can be reshaped and that motivation can lead to higher levels of engagement. Since animals have been shown to increase children’s motivation, attention-span, and performance of cognitive tasks, it would stand to reason that argumentative writing lessons involving animals could positively reshape attitudes, keep the child engaged longer, and result in increased academic success (Edenberg, 2011; Gee, 2012).

Designed on sound principles, years of research, and best practices, the “Egg Proj-*chick*” unit on argumentative writing is projected to be an effective method of teaching academic skills. A more in-depth experiment using the pre- and posttests on experimental and control groups is beyond the scope of this study, however it is one that is worth pursuing. Literature and research

pertaining to animals' effects on children's cognitive development is extremely scarce, and this project offers an opportunity to conduct much-needed scientific inquiry on this topic.

Chapter 3: Project Overview

Methodology

“Egg Proj-*chick*” lesson plans were created using the Common Core State Standards as a guide. All of the lessons support CCSS ELA-Literacy.W.7.1: “Write arguments to support claims with clear reasons and relevant evidence,” as this is the foundation for argumentative writing.

Before beginning the unit, the teacher is asked to administer a pre-test argumentative writing sample for data collection purposes. The scores will be compiled and then compared to those from a posttest at the end of the unit. It is important that the instructor notes that it is not intended for these lessons to be taught on consecutive days. Rather, they are to be infused throughout the 21 days that it takes the chicks to hatch. Students are to resume their regular unit of study on the “off” days.

The focus of first two lessons is to introduce the students to the components of argumentative writing, and it is assumed that they have prior knowledge of the basic structure of an essay. During these sessions, they will learn the purpose of an introduction, the definition of a “claim”, and the strategic use of a “counter-argument”, among other elements. A comparison will be drawn between the introduction of the chick unit and the introduction of an argumentative piece. The teacher will instruct students on the function, importance, and elements of that first paragraph. Counter-arguments will then be highlighted and practiced as a group. Information about chick hatching is infused throughout each one of the lessons.

The next two class periods build on Standard W.7.1a – introducing claims – as the instructor will teach students how to find and use evidence from a credible text entitled “The Parts of the Egg” to support their claim (see Appendix E). While learning about the parts of an egg, students will be asked the question “Does an egg make an ideal home for a developing

chick?” Although the answer is quite obvious, the idea is to have all students “on the same page” as they learn, through guided practice, how to find and use evidence from the text. The class will work in small groups while reading the article and completing the worksheet “Where’s the Evidence” (see Appendix F).

One will note that the colors green and red were used on the worksheet, and that they correspond to a visual aid called “Argumentative Writing Structure” that uses the same colors (see Appendix G). The purpose of this poster is to represent in color – not in words – the structure of an argumentative writing piece. The green denotes the student’s opinion and its supporting evidence, while the red indicates counter-arguments. This visual aid helps the students remember how many paragraphs they are to include and where to indent, and it should remain up for the duration of the unit. The colored sections on the worksheet will assist the students when they must decide what information goes where when writing their first argumentative essay.

During the final class periods, students will be asked another question, this time in the form of a more complex prompt: “Pretend that you are a farmer who sells eggs. You have decided to purchase a new breed of chicken that will lay eggs to increase your sales. Do research and select the breed of chicken that you would buy. Use evidence from the text to support your claim.” In their argumentative essay response, they will have to use the structure they have learned, make a claim, and provide supporting evidence from a non-fiction text. All of this should be done with as little assistance as possible, although the teacher should still provide guidance when needed.

Having written two full argumentative pieces, the students should have gained an understanding of the structure and the elements that make-up this type of writing. An assessment

of their skills and knowledge will be conducted within three days of the last lesson. In this posttest, they will be asked to read a passage on-grade level and respond to an argumentative prompt. Answers will be scored and data regarding student performance should be recorded and analyzed to look for trends.

These lesson plans were given to a highly qualified Language Arts Middle School teacher, Mrs. Kelly Kawalek, who is also the District Supervisor of Language Arts in Ewing Township, New Jersey. Mrs. Kawalek, was trained extensively in assessing whether or not curriculum meets the CCCS, so she is very knowledgeable in this area. Further, she previously worked for ETS (Educational Testing Service), which is currently the world's largest private non-profit educational testing and assessment organization. Mrs. Kawalek also taught Language Arts for over a decade at the middle school level, so she is acutely aware of what does – and does not – work in the classroom. Mrs. Kawalek was then given a feedback form that she completed after reviewing the lesson plans. A copy of her final review can be found in Appendix I.

Instrumentation

The goal of this project was to meet the Common Core State Standards for Language Arts using a non-conventional, animal-centered approach to teaching argumentative writing. As such, the feedback form asks responders to analyze and evaluate the lesson plans to determine whether or not the standards were met. The instrument uses the CCSS as benchmarks, and the evaluator was trained in assessing whether or not lesson plans meet those standards.

Project Evaluation

To achieve the purpose of the study, a certified, highly qualified Language Arts middle school teacher who is also a District Supervisor of the Language Arts Department reviewed and evaluated the lesson plans. A feedback form was completed, reflecting the feasibility of the

lesson plans, as well as an assessment of their quality and adherence to the CCSS standard objectives (see Appendix I).

Chapter 4: Project Outcomes

Summary of Outcomes

Language Arts Department Supervisor and former writing instructor Kelly Kawalek reviewed the “Egg Proj-*chick*” lesson plans and completed the Feedback Form. Objective one sought to provide a learning experience where students could introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically. The evaluator felt that the lesson did meet the objectives but did have some questions about the appropriateness for each age group given that the rubric is used for both 6th and 7th graders. This unit was originally designed for 6th graders, however Ms. Kawalek noted that 6th graders are not required to provide counter-arguments, while 7th graders are. She wrote, “There are differences between the gr. 6 and gr. 7 standards for argumentative writing so one rubric may not address both. One major difference is the need for 7th grade to acknowledge opposing claims/perspectives.” Further, after reading the Assessment at the end of Lesson 1, Ms. Kawalek stated, “Was this [counter-argument] the key focus for the day? If you are giving the[m] one thing on which to focus, then it should be the main focus for the lesson. To me, this lesson is about all parts of the argumentative essay, not just the counter-argument.” As a result of her feedback, I adjusted the target audience for this unit and designed it for 7th graders and added CCSS.ELA-Literacy.W.7.1a to the Objectives section in Lesson One. The “Egg Proj-*chick*” lessons truly met the 7th grade standards, as opposed to 6th, because counter-arguments were incorporated into the unit.

The aim of Objective Two was for students to support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text. The evaluator agreed that the objectives were, again, met. She did have a comment about

the phrasing of one of the questions, which could potentially have had an effect on student claims. In one of the lessons, I had originally written “Why does an egg make an ideal home for a developing chick?” to which Ms. Kawalek had this to say: “This sounds more like an OEQ [open-ended question], not an argumentative piece. You are giving the position and it’s not a controversial one so what’s the argument? But perhaps this learning objective is helping students to cite evidence and to build background knowledge for a future argumentative essay? It’s a good skill but not an argumentative essay.” Ms. Kawalek was correct that the objective was to teach students to find evidence in a text to support their claim, so I kept the activity as it was originally written. What I did change, however, was the question. I rewrote it so that it is now phrased: “Does an egg make an ideal home for a developing chick?” I also updated the accompanying Student Worksheet (see Appendix F), which posed the same question. Thus, students have to take a position and support it with proof from the text. Although it is not a controversial issue, the point of the lesson is for students to learn how to locate and cite information that will bolster their claim. This skill lays groundwork for future argumentative essays that are more complex, just as Ms. Kawalek suspected.

Discussion and Implications

The results of this project as provided by the expert indicate that it is an acceptable instructional tool to teach and reinforce Standard W.7.1 in the 2010 Common Core Standards for English Language Arts. Based upon her feedback, the objectives of each lesson were targeted and appropriate, the material list was comprehensive, and the procedures were clear and complete.

There were several other comments that the Supervisor noted while reviewing the unit, including: “[t]he use of animals in the classroom must get building and Board approval because

of the increase of students with asthma and allergies.” Thus, if permission were obtained from the school principal and the Board of Education, these plans would be feasible. Although not partial to animals, Ms. Kawalek was impressed with the research behind animal-assisted education, and she wrote, “Wow! The research on the benefits of animals is powerful.” She further commented that she now wanted to get her pre-school-aged son a pet fish.

The Supervisor also mentioned that many schools are not permitting animals in classrooms because of the increasing number of students with asthma. She asked how I would troubleshoot this for someone interested but not permitted to have animals in the classroom. In answer to this question, a discussion with the principal about whether or not a developing egg constitutes “an animal” would have to take place. Developing eggs in a clean, sanitized incubator are not chickens, and unless a child is allergic to eggshells, the eggs will not trigger an asthma attack. Therefore, it is possible that the hatching unit would be considered safe for all participants, even to those who have allergies or asthma. As a precautionary measure, the school nurse should be consulted and all students who participate in the unit must have a signed permission form from a parent or guardian indicating whether or not they are allergic to baby chicks. A few days before the chicks are ready to hatch, the instructor can take the incubator home to finish hatching the chicks and videotape a chick emerging to show the class. As another alternative, the instructor can bring a few baby chicks in to school in a glass tank or other type of enclosure to show the class. If there are any students with allergies, they can be excused from the room and the lesson that day. Another option is to keep the chicks in another room in the school where they will be safe and walk the students who are not allergic down to see them. Using this method ensures that no chicks will enter the regular classroom to contaminate the air.

In her analysis of the unit, the Supervisor asked, “Will daily or unit learning objectives be

posted for students?” As such, in order to make these lessons as effective as possible, I noted in each lesson that the objectives should be written on the board for all students to see. That way, they will know what is expected of them and the daily learning goals will not be ambiguous.

A suggestion that Ms. Kawalek made in her evaluation was that the closure should consist of “active-learning or student-centered” reviews of the lesson, as opposed to a passive verbal summary. I went back through my lesson plans and added the following to the closure: “Active learning techniques such as ‘turn and talk’, student generated questions and answers, and other strategies can be used, as appropriate.”

Lastly, when asked, “Did the lesson plans collectively address the main standard and its sub-components, as listed above,” she stated, “Yes.” Ms. Kawalek added, “It would be interesting to analyze the pre-post data to consider students with behavior or focusing issues. Do the data mirror what the research indicates?” Another comment from Ms. Kawalek highlighted the fact that my lesson plans also addressed reading and writing standards for literacy in science, which she attached for my review. According to the CCSS for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects, the elements that I incorporated were: 1) citing evidence from the text to support analysis, and 2) distinguishing among facts, judgment, and speculation in a text (“Common Core State Standards for English,” 2012).

Taken in its entirety, the Supervisor’s feedback supports my framework in that it is, in fact, possible to construct and teach a complete unit on argumentative writing that features animals as its theme. She noted that data collection would be beneficial in order to determine whether or not the lesson was successful. Ms. Kawalek also added that it might be useful to conduct a separate study on children who have behavior or attention issues to ascertain whether they are able to focus better with animal-centered lessons. My framework provides opportunities

for data collection that can be used to ascertain a correlation between animal-assisted education and cognition. If there is a relationship between the two, my project may be used as a guide after which others may model future AAE units of study.

Recommendations

Further empirical evidence is needed on the effectiveness of the curriculum. “The Egg Proj-*chick*” lesson should be used by a variety of educators as outlined. The data should be compiled, evaluated, and assessed to see if, in fact, animals have a positive effect on children’s cognitive development. Further, based upon feedback, the lesson plans can then be revised should there be difficulties that arise or modifications that need to be made.

In addition, several potential research questions arise from such a study. First, are there certain kinds of animals that are more effective than others in AAE? If so, which ones? Are common animals like dogs and cats less intriguing, and thus less effective for skill development, than a chinchilla? Do animals that show affection have more positive effect on children’s learning abilities than animals that do not? Do certain academic subjects show more marked student skill improvement when AAE is employed? For example, if chicks are used to teach multiplication skills, is the percentage of growth higher than it is for argumentative writing? Is there an age when AAE is more or less successful for children? All of these questions are worth exploring, both quantitatively and qualitatively.

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Appendices

APPENDIX A:

NAEP definitions of the three types of achievement levels that can be obtained

Grade 8

<p><i>Basic</i> (120)</p>	<p>Eighth-grade students writing at the <i>Basic</i> level should be able to address the tasks appropriately and mostly accomplish their communicative purposes. Their texts should be coherent and effectively structured. Many of the ideas in their texts should be developed effectively. Supporting details and examples should be relevant to the main ideas they support. Voice should align with the topic, purpose, and audience. Texts should include appropriately varied uses of simple, compound, and complex sentences. Words and phrases should be relevant to the topics, purposes, and audiences. Knowledge of spelling, grammar, usage, capitalization, and punctuation should be made evident; however, there may be some errors in the texts that impede meaning.</p>
<p><i>Proficient</i> (173)</p>	<p>Eighth-grade students writing at the <i>Proficient</i> level should be able to develop responses that clearly accomplish their communicative purposes. Their texts should be coherent and well structured, and they should include appropriate connections and transitions. Most of the ideas in the texts should be developed logically, coherently, and effectively. Supporting details and examples should be relevant to the main ideas they support, and contribute to overall communicative effectiveness. Voice should be relevant to the tasks and support communicative effectiveness. Texts should include a variety of simple, compound, and complex sentence types combined effectively. Words and phrases should be chosen thoughtfully and used in ways that contribute to communicative effectiveness. Solid knowledge of spelling, grammar, usage, capitalization, and punctuation should be evident throughout the texts. There may be some errors, but these errors should not impede meaning.</p>
<p><i>Advanced</i> (211)</p>	<p>Eighth-grade students writing at the <i>Advanced</i> level should be able to construct skillful responses that accomplish their communicative purposes effectively. Their texts should be coherent and well structured throughout, and they should include effective connections and transitions. Ideas in the texts should be developed logically, coherently, and effectively. Supporting details and examples should skillfully and effectively support and extend the main ideas in the texts. Voice should be distinct and enhance communicative effectiveness. Texts should include a well-chosen variety of sentence types, and the sentence structure variations should enhance communicative effectiveness. Words and phrases should be chosen strategically, with precision, and in ways that enhance communicative effectiveness. An extensive knowledge of spelling, grammar, usage, capitalization, and punctuation should be evident throughout the texts. Appropriate use of these features should enhance communicative effectiveness. There may be a few errors, but these errors should not impede meaning.</p>

APPENDIX B:

Grade 7 Language Arts Literacy Assessment Sample

Pre-test Argumentative Writing Sample Prompt

Writing Task

Read the passage below and respond to the prompt.

Is it important for scientists to study earthquakes? Use evidence from the text to support your claim.

Earthquakes: Movement of the Earth's Crust

Earthquakes are the shaking and moving of the ground when energy is released in waves. These waves are called seismic waves. These waves are similar to ocean waves, which move through water. Seismic waves, however, move through the ground.

Most earthquakes are caused by the movement of large sections of the Earth's crust, called plates. The place where two plates meet is called a fault. Faults look like large cracks in the ground. If the two plates move in different directions, they build up energy at the fault line. When enough energy builds up, the stress on the fault becomes too great and it ruptures. This releases the energy and the ground starts to shake.

Earthquakes can also be caused by other natural events, such as landslides and volcanoes. Man-made earthquakes happen because of nuclear testing and mining explosions.

The first movement of an earthquake, called the main shock, is often followed by smaller ground trembles, called aftershocks. These aftershocks are the plates settling into their new position. Aftershocks can continue for days after the main shock.

There are an estimated 500,000 earthquakes around the world each year. Most are so mild they are only recorded on scientific instruments. Only about 100,000 can be felt by humans. Of these, only about 19 a year cause major damage.

Major earthquakes in populated areas can cause huge destruction. Buildings collapse, roads and bridges buckle and crack, and electrical and gas lines break and cause fires. If the earthquake happens in the ocean, it makes a series of huge ocean waves called a tsunami. The tsunami travels until it finally reaches land, where it causes large flooding.

Scientists are searching for ways to predict earthquakes. They study the historical patterns of earthquakes and monitor the movement of the plates with seismic equipment. While they cannot predict an exact date of a future earthquake, they have a better understanding of when earthquakes are more likely to happen.



Earthquake damage in Washington in 2001



Aerial view of the San Andreas fault in California

The text above was written at a 7.2 Literacy Level.

Retrieved from http://www.k12reader.com/reading-comprehension/GR7_Earthquake.pdf

APPENDIX C:
Language Arts Literacy
Writing

New Jersey Holistic Scoring Rubric - Grades 6 and 7

In scoring, consider the grid of written language	Inadequate Command	Limited Command	Partial Command	Adequate Command	Strong Command	Superior Command
Score	1	2	3	4	5	6
Content & Organization	<input type="checkbox"/> May lack opening and/or closing <ul style="list-style-type: none"> • Conclusion does not restate any arguments 	<input type="checkbox"/> May lack opening and/or closing <ul style="list-style-type: none"> • Conclusion brings up new arguments 	<input type="checkbox"/> May lack opening and/or closing <ul style="list-style-type: none"> • Conclusion restates one argument 	<input type="checkbox"/> Generally has opening and/or closing <ul style="list-style-type: none"> • Conclusion restates some arguments 	<input type="checkbox"/> Opening and closing <ul style="list-style-type: none"> • Conclusion restates all arguments 	<input type="checkbox"/> Opening and closing Conclusion restates all arguments very effectively
(message communicated to audience and stays on-topic)	<input type="checkbox"/> Minimal response to topic; uncertain focus	<input type="checkbox"/> Attempts to focus <input type="checkbox"/> May drift or shift focus	<input type="checkbox"/> Usually has single focus	<input type="checkbox"/> Single focus	<input type="checkbox"/> Single focus <input type="checkbox"/> Unified & easy to understand <input type="checkbox"/> Key ideas developed	<input type="checkbox"/> Single, distinct focus <input type="checkbox"/> Unified & easy to understand <input type="checkbox"/> Well-developed
	<input type="checkbox"/> No planning evident; disorganized	<input type="checkbox"/> Attempts organization <input type="checkbox"/> Doesn't really flow smoothly from one idea to the next	<input type="checkbox"/> Some errors in organization <input type="checkbox"/> Sometimes smoothly flows from one idea to the next	<input type="checkbox"/> Ideas loosely connected <input type="checkbox"/> Almost always flows smoothly from one idea to the next	<input type="checkbox"/> Logical progression of ideas <input type="checkbox"/> Sentences are varied <input type="checkbox"/> Attempts to take risks	<input type="checkbox"/> Logical progression of ideas <input type="checkbox"/> Sentences are varied & interesting <input type="checkbox"/> Successfully took risks
	<input type="checkbox"/> There are no reasons and/or evidence is not relevant	<input type="checkbox"/> Support claim(s) with 1 clear reason and relevant evidence	<input type="checkbox"/> Support claim(s) with 2 clear reasons and but not all evidence is relevant	<input type="checkbox"/> Support claim(s) with 2 clear reasons and relevant evidence	<input type="checkbox"/> Support claim(s) with 3 clear reasons and but not all evidence is relevant	<input type="checkbox"/> Support claim(s) with 3 clear reasons and relevant evidence
Understanding of the Topic / Text	<input type="checkbox"/> Non-credible sources used and student does not understand topic / text	<input type="checkbox"/> Non-credible sources used and student understands little of topic / text	<input type="checkbox"/> Non-credible sources used, but student somewhat understands topic / text	<input type="checkbox"/> Credible sources used and student somewhat understands topic / text	<input type="checkbox"/> Credible sources used and student has good understanding of topic / text	<input type="checkbox"/> Credible sources used and student clearly understands topic / text
Sentence Construction (a variety of sentence types are used, structure & length are varied)	<input type="checkbox"/> Assortment of incomplete and/or incorrect sentences	<input type="checkbox"/> Excessive monotony/same structure <input type="checkbox"/> Numerous errors	<input type="checkbox"/> Little variety in syntax <input type="checkbox"/> Some errors	<input type="checkbox"/> Some errors that do not interfere with meaning	<input type="checkbox"/> Few errors	<input type="checkbox"/> Very few, if any, errors
Mechanics (correct spelling, capitalization, punctuation)	<input type="checkbox"/> Errors so severe they detract from meaning	<input type="checkbox"/> Numerous serious errors	<input type="checkbox"/> Patterns of errors evident	<input type="checkbox"/> No consistent pattern of errors <input type="checkbox"/> Some errors that do not interfere with meaning	<input type="checkbox"/> Few errors	<input type="checkbox"/> Very few, if any, errors

APPENDIX D:

LESSON PLANS

MAIN STANDARD:

CCSS.ELA-Literacy.W.7.1 Write arguments to support claims with clear reasons and relevant evidence.

SUB-COMPONENTS:

- CCSS.ELA-Literacy.W.7.1a - Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
- CCSS.ELA-Literacy.W.7.1b - Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.

Retrieved from: <http://www.corestandards.org/ELA-Literacy/W/7>

“The Egg Proj-chick: Cracking the Code of Argumentative Writing”

NOTE: Prior to beginning Lesson 1, the instructor must administer the Pre-test Argumentative Writing Sample Prompt [Appendix B]. Students should be allowed 45 minutes to complete this task – 5 minutes for reading and 40 minutes for writing. Samples should be collected and scored using the NJ Holistic Scoring Writing Rubric [Appendix C]. All samples should be kept on-file for comparison purposes.

ADDITIONAL NOTE: It is not intended for these lessons to be taught on consecutive days. Rather, they are to be infused throughout the 21 days that it takes the chicks to hatch. Students are to resume their regular unit of study on the “off” days.

Grade: 7

Time Allotment: (2) 45-minute class periods

Lesson 1 & Lesson 2

Common Core State Standards

Language Arts:

- CCSS.ELA-Literacy.W.7.1a Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.

Objectives: Students will be able to:

- define the word “introduction,” what the purpose of one is, and how it relates to writing
- define the terms “hook” and “triple threat”
- explain what a “claim” is and give examples of “reasons”
- define the word “counter-argument,” compose one, and create a rebuttal

The above objectives should be written on the board for all students to see.

Materials: fertilized eggs, cleaning solution, incubator that has been regulated and running for at least 2 days, pictures of different kinds of chickens (can be retrieved from <http://www.backyardchickens.com/products/category/chicken-breeds/page/10>), dry erase markers, whiteboard

Procedure: 1) Lesson will begin with the instructor introducing the unit of study and modeling this introduction after an argumentative writing essay. For example, the introduction to the lesson should not give away all of the details in the beginning- it should begin with a hook (a catchy introductory line) and state the main objective, giving the students a general idea about the direction this project will go. An example would be to start the lesson by making 3 different types of chicken sounds to represent a “triple threat” hook. “Squawk! Cock-a-doodle-doo! Cluck-cluck!” or “Leghorn. Red Star. Barred Rock.”

2) Begin a discussion with the following question, which should be written on the board: “Should this class be allowed to participate in an egg hatching project this year?” The idea is to get students to come up with reasons “why” they should. Identify that their “claim” is that they should, in fact, be permitted to do so. Solicit answers from students and write the top two reasons “why” they should be permitted to participate on the board underneath the question. With the help of the class, develop those reasons by adding some details to each – one at a time.

3) Once those 2 reasons have been developed, introduce the idea of a counter-argument. What might someone say who does *not* want them to do this project? What reasons might be given? Write one counter-argument on the board underneath the 2 reasons, and then write its rebuttal. For example: “Now some people may say that 7th graders are not responsible enough to hatch chickens successfully. However, this just doesn’t hold water. We complete and bring in our homework everyday, which shows that we are reliable when it comes to daily tasks. Still others may argue that kids in our age group aren’t gentle enough and we’ll break the eggs. This is for the birds! Many of us make breakfast for ourselves in the mornings, so we know how – and how *not* – to handle delicate shells.”

4) Once the class has “convinced” the teacher with 2 reasons and 2 refuted counter-arguments, it is time to place the eggs safely in the incubator. Remind students that the baby

chicks will be hatching in 21 days and go over some basic information about incubation with them.

5) Closure: Ask students what “hook” was used at the beginning of this lesson. Remind them that we always begin our introductions with some sort of catchy lead. In this case, it was a “triple threat,” but others can be reviewed at this time. This should be a review for the students. Active learning techniques such as “turn and talk,” student generated questions and answers, and other strategies can be used, as appropriate. Some examples might be: asking a rhetorical question or starting with an interesting quote or piece of dialogue. Arguments and counter-arguments should also be reviewed. The teacher can point to each on the board and ask students to identify which one it is. Before students leave the classroom, ask them to jot down a “claim” of any kind and supply 2 bullet-pointed reasons to support this claim. This is to be handed in as an “Exit Slip” when they depart.

Assessment: Submitted claims and reasons should reflect an understanding of the terms “claim” and “reason.”

Lesson 3 & Lesson 4

Grade: 7

Time Allotment: (2) 45-minute class periods

Common Core State Standards

Language Arts:

- CCSS.ELA-Literacy.W.7.1a Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
- CCSS.ELA-Literacy.W.7.1b Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

Objectives: Students will be able to:

- identify the important parts of an egg – shell, yolk, thick / thin albumin, chalaza, germinal disk, vitelline membrane, air sac
- recall and define introduction, hook, triple threat, reasons, and counterarguments
- introduce claim and organize the reasons and evidence clearly

- find and use supporting evidence from non-fiction text to support their claim
- support claim with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text
- create an effective counter-argument and rebuttal

The above objectives should be written on the board for all students to see.

Materials: picture of the inside of an egg (<http://extension.psu.edu/4-h/projects/poultry/embryology/teacher-resources/supporting-subject-matter/the-egg/the-parts-of-the-egg>)

and/or an actual egg that's been cracked open, dry erase markers, a table top should be set up so that all students can crowd around to see the cracked egg, vocabulary words for eggs written out on strips of paper (sentence strips) that will eventually be posted on the whiteboard; copies of "The Parts of the Egg" for each student, color copies of "Where's the Evidence" worksheets for each student

Procedure: 1) Ask students "Which came first? The chicken or the egg?" Engage them in possible answers. Tell students that we are going to be discussing the parts of an egg today. Ask them to come up with a triple threat that has to do with eggs. Some examples may be: "Scrambled. Poached. Sunny-Side-Up!" or "Ovum. Opaque. Oval." Ask students what the purpose of a triple threat is and why it's so important.

2) Let the class know that the eggs are on Day X of incubation, and that there are "Y" number of days until the chicks hatch. Tell them that they will be looking at an egg today. They've probably seen eggs many times, however we are going to look at it in more detail. We're going to "zoom in" and take a closer look at it. This is the kind of thing we want to do with our writing, too... take a closer look at things and describe them using sophisticated details.

3) The instructor will point out the parts of egg including shell membranes and the elements that make up the yolk & egg white. These corresponding sentence strips should be introduced as each new word is said and placed on the desktop. Once completed, take turns "pop quizzing" students by calling out a new term and having them point to it. An extension is to then have students (instead of the teacher) call out the term and select another student to identify where it is.

4) Once students are fairly comfortable with terminology, they will return to their seats for the next phase. Prep them for their task – they will answer the question: "Does an egg make an ideal home for a developing chick? Use evidence from the text to support your claim." In groups of 3-4, they should read a non-fiction article about eggs entitled "The Parts of the Egg" [Appendix E]. In preparation for this 2-day project, students will read it aloud in groups in preparation to answer question. They will complete a worksheet called "Where's the Evidence?" [Appendix F] that guides them through the process of finding evidence from the text to support their claim.

5) Students will complete the worksheet with their groupmates as the teacher circulates around, offering guidance. Upon completion, the teacher will check their work, and students will have an opportunity present their claims and evidence to the class. Members of the audience will be asked to locate other students' claims in the article. Debrief with students about what they did well and what they need to remember to do. If time permits, have students come up with counter-arguments and rebuttals. Worksheets should be collected, as they will be utilized in the next lessons.

6) **Closure:** Before they leave, students will demonstrate their understanding of the parts of the egg by recalling and defining a vocabulary word that pertains to egg structure.

Assessment: Students will demonstrate their understanding by completing the worksheet "Where's the Evidence."

Lesson 5, Lesson 6, and Lesson 7

Grade: 7

Time Allotment: (3) 45-minute class periods

Common Core State Standards

Language Arts:

- CCSS.ELA-Literacy.W.7.1a Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
- CCSS.ELA-Literacy.W.7.1b Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

Objectives: Students will be able to:

- observe and explain, in detail, what they see when candling the egg
- introduce claim in essay form and organize the reasons and evidence clearly
- find and use supporting evidence from non-fiction text to support their claim; this is designed to lay groundwork in citing evidence for their final argumentative post-test piece

- support claim with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text
- *The above objectives should be written on the board for all students to see.*

Materials: “Where’s the Evidence?” student worksheets from Lessons 3 & 4, a copy of “Argumentative Writing Structure” color picture [Appendix G] to hang in the front of the room; a box within which it will be dark enough to successfully candle eggs; candler

Procedure: 1) Introduce lesson by asking students what candles are used for. Solicit responses and then inform students that back in the “old days,” candles were used to actually be able to see inside chicken eggs. Today, we use electric devices that look a little like flashlights, but we still call it candling. We’re going to take turns looking inside the developing eggs today.

2) Hand out “Where’s the Evidence” student worksheets from the previous lessons. Give students a moment to review what they wrote and revisit “arguments” vs. “counter-arguments” with the class. Hang up the “Argumentative Writing Structure” color picture [Appendix G]. Students will use this as a guide as they work on their argumentative essays. Each student will create a formal argumentative essay on the following topic “Does an egg make an ideal home for a developing chick? Use evidence from the text to support your claim.”

3) While students are working independently (or in pairs or small groups), the instructor will be candling eggs for the students. Each group will be called up to see the little chick wriggling around inside the egg. Once all groups have seen the chick, the instructor should circulate and check student progress. Students will work up until 5 minutes before class, at which time the teacher will review key skills utilized today and preview Lessons 6 and 7 – during which students will write and conclude their essays.

4) Upon completion of the essays during Lesson 7, students will have opportunities to share their writing with a small group, if they wish. Students should highlight lines they’re most proud of and share those few lines with the entire class, if they so choose. Closure: the teacher will review argumentative writing structure, candling, and ask students to jot down 5 things they learned on “Chick Lesson” days. These will be handed to the teacher as “Exit Slips” when they leave the classroom.

Assessment: Exit slips will highlight the elements of the lessons that stood out to students; argumentative writing essays will demonstrate student understanding of the standards and of the structure.

Lesson 8, Lesson 9, and Lesson 10

Grade: 7

Time Allotment: (2) 45-minute class periods

Common Core State Standards

Language Arts:

- CCSS.ELA-Literacy.W.7.1a Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
- CCSS.ELA-Literacy.W.7.1b Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

Objectives: Students will be able to:

- Observe, compare, and contrast different breeds of chickens
- introduce their claim in essay form and independently organize the reasons and evidence clearly
- find and use supporting evidence from non-fiction text to support their claim
- support claim with clear reasons and relevant evidence, while using credible sources and demonstrating an understanding of the topic or text

The above objectives should be written on the board for all students to see.

Materials: Access to a computer lab with internet (if this is not possible, booklets made for students that include color photos and descriptions of chickens from http://www.mcmurrayhatchery.com/standard_breed_chicks.html)

Procedure: 1) Begin the lesson by holding up a color picture of a Leghorn chicken and ask if any students have ever seen a chicken that looks like it. Give them a brief description of this bird. Then, hold up a color picture of a Buff-Laced Polish and talk about its characteristics. Have the students compare and contrast the two fowl. Define the word “breed” and ask students to name breeds of dogs. Tell students there are also many breeds of chickens. Today, they will have a question posed to them about chickens and they’ll do research to answer that question using evidence from the text.

2) Write the prompt on the board so that all students can see it. It should read, “Pretend that you are a farmer who sells eggs. You have decided to purchase a new breed of chicken that will lay eggs to increase your sales. Do research and select the breed of chicken that you would buy. Use evidence from the text to support your claim.” They will use Lesson 8 and part of Lesson 9 to do the research and plan what they will say, and then they will write an argumentative essay stating their opinion due by the end of Lesson 10.

3) We will review the structure of an argumentative essay. Students will be instructed that they will use what they have learned to write their own argumentative piece, unassisted.

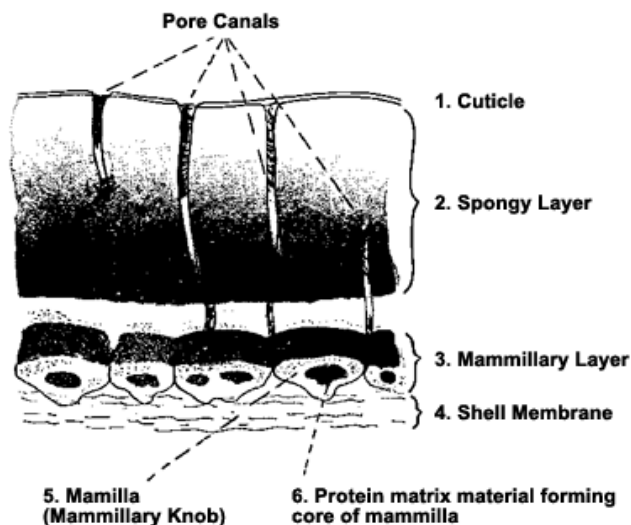
4) Students will then either go on-line to do their research - http://www.mcmurrayhatchery.com/standard_breed_chicks.html - or review the color chicken breed booklets. They will take notes on information and quotes they will need to respond to the prompt. Students may use their previous argumentative writing worksheets or argumentative piece for guidance, if needed.

5) As instructed, they will then begin their argumentative pieces and finish them by the end of Lesson 10. This will conclude the instructional part of Argumentative Writing. Once the chicks hatch, they should be shown to the students who must be taught how to interact safely and respectfully with them. The safety of the chicks must be monitored at all times.

NOTE : Within three days of the completion of Lesson 10, it is suggested that the instructor administer the posttest Argumentative Writing Sample Prompt [Appendix H]. The Argumentative Writing Structure chart should not be in view. Students should be allowed 45 minutes to complete this task – 5 minutes for reading and 40 minutes for writing. Samples should be collected and scored using the NJ Holistic Scoring Writing Rubric [Appendix C]. All samples should be kept on-file for comparison purposes.

The Parts of the Egg

Looking at the egg from the outside we see the shell, which is a hard, protective covering composed primarily of calcium carbonate. The shell is porous and the large end contains more pores than the small end of the egg. (There are about 7,000 pores in a chicken eggshell.) This permits the transfer of gases through the shell. Carbon dioxide and moisture are given off through the pores and are replaced by atmospheric gases, including oxygen.



Immediately beneath the shell are two membranes, the outer and inner shell membranes. These membranes protect the contents of the egg from bacterial invasion and prevent too rapid evaporation of liquid from the egg.

Because the body temperature of a hen is approximately 106°F, eggs are very warm at the time they are laid. The temperature of the air is usually much lower than 106°F, and the egg cools to the temperature of its surroundings. As cooling takes place, the contents of the egg contract more than does the shell of the egg. This creates a vacuum and air is normally drawn through the pores in the large end of the shell.

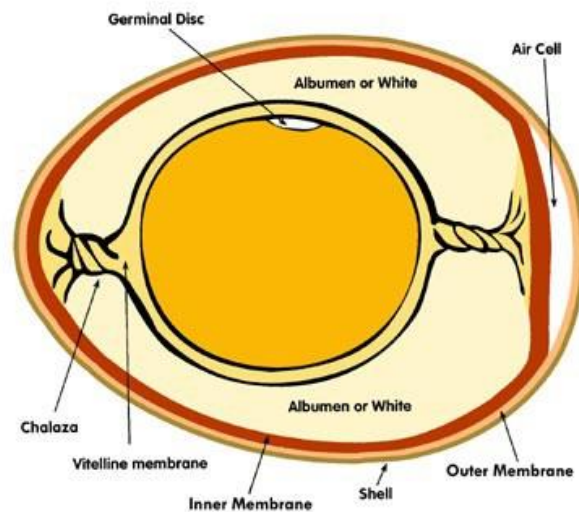
As a result, an air cell forms at the large end of the egg. The air cell serves as a tiny shock absorber during early embryonic development, and on the 20th day of incubation the chick pokes its beak through the shell membranes into the air

cell (which by this time has enlarged greatly) and draws its first breaths of air from this space.

While the embryo is growing, the shell membranes surround and contain the white or albumen of the egg. The albumen provides the liquid medium in which the embryo develops, but it also contains a large amount of the protein necessary for proper development.

In a fresh egg, one can see white cords attached to the yolk sac. These two cords, each called chalaza, are made of twisted strands of fibers that are a special form of protein. The chalazae are like anchors and they hold the yolk in the center of the egg.

The yolk contains large amounts of carbohydrates, fat, and protein. The egg white (albumen) is almost pure, high-quality protein. The yolk is also a reservoir of the vitamins and minerals that are essential for normal growth. These substances combine with the oxygen taken in through the pores of the shell and provide a source of energy for the embryo. By-products of this process are carbon dioxide and water. Carbon dioxide leaves the egg through the pores of the shell. Calcium absorbed from the yolk and shell are used by the embryo to make its bony structure, or skeleton.



<http://extension.psu.edu/4-h/projects/poultry/embryology/teacher-resources/supporting-subject-matter/the-egg/the-parts-of-the-egg>

Appendix F: Student Worksheet

Name _____



Where's the Evidence?

You and your groupmates will read the article entitled "The Parts of the Egg" and respond to the following question: "Does an egg make an ideal home for a developing chick?" You will need EVIDENCE from the text to support your opinion. On the lines below, you will write quotes from the text that support your claim.

Write your claim here:

Examples: An egg makes a terrible home for a developing chick.

OR

An egg makes a perfect home for a developing chick.

Write a quote (1 or 2 sentences) from the text that supports your claim. Add quotation marks at the beginning and end!

How does this quote support your claim? (Ex: "So, this tells me that...")

Now, write a different quote (1 or 2 sentences) from the text that supports your claim. Remember the quotation marks at the beginning and end!

How does this quote support your claim? (Ex: "Clearly, this quote indicates that...")

It's time to think of a counter-argument to your claim. For example, what reason might someone give if they were arguing with you? (Ex.: "Now some people may argue that...")

How would you argue back? (Ex.: "This claim doesn't hold water because...")

What ELSE might someone say who's arguing? (Ex.: "Still others may say that...")

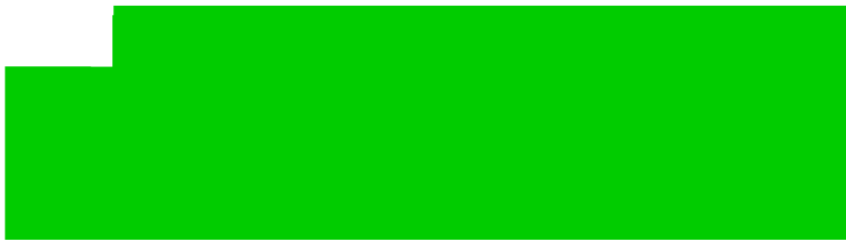
What would you say in response? (Ex.: "This argument isn't convincing because...")



Created by Suzanne Merrill

Appendix G: A visual aid that shows the “color structure” of an argumentative essay

Argumentative Writing Structure



Created by Suzanne Merrill

APPENDIX H:


Grade 7 Language Arts Literacy Assessment Sample

Posttest Argumentative Writing Sample Prompt

Writing Task

Read the passage below and respond to the prompt:

Based upon what you have read, do you think that coyotes should be hunted? Use evidence from the text to support your claim.



COYOTE:

the Survivor of North America

The coyote is a relative of the dog, wolf and jackal. Like its relatives, it is a predator and mostly eats other mammals. It will, however, eat a wide variety of foods, including insects, fruits and vegetables.

Coyotes are found throughout most of North America, from Mexico and Central America to Canada and Alaska. The color of its coat depends on where it lives. Mountain coyotes are darker than those living in the desert.

Like the wolf, coyotes live in groups, or packs. The pack is usually smaller in number than a wolf pack. All members of the pack are usually related. The pack will often divide into pairs to hunt.


Female coyotes have a litter of pups once a year. A litter has an average of six pups. Over half of the pups will die before they reach adulthood. Male pups usually leave the pack to find their own territory. Female pups stay with the parent's pack.

Wolves and coyotes compete for the same prey animals. Since the coyote is smaller than the wolf, wolves will usually drive the coyote out of any shared territory.


The coyote adapts easily to new areas. Unlike the buffalo or wolf, the coyote's range increased after human populations expanded across the continent. For example, the coyote was not native to New England. Once the New England settlers eliminated wolves, however, the coyote moved in. Scientists who have studied the coyote believe it is better than the wolf at living in human areas.

Coyotes are now found in most large urban areas. They find an abundant supply of food in these areas, since coyotes are willing to eat garbage, rodents and even small pets, such as cats. Scientists estimate that as many as 2,000 coyotes may be living in the Chicago area.

Because of its adaptability, the coyote is not an endangered species, or even a threatened species. It has been classified as "least concern," which means it has the lowest risk of extinction.



The coyote communicates with other coyotes by howling or yipping.



A very young coyote pup

The text above was written at a 7.2 Literacy Level.

Retrieved from: http://www.k12reader.com/reading-comprehension/GR7_Coyote.pdf

APPENDIX I:

APPENDIX H:

Evaluator's Feedback Form

MAIN STANDARD:

CCSS.ELA-Literacy.W.6.1 Write arguments to support claims with clear reasons and relevant evidence.

SUB-COMPONENTS:

- CCSS.ELA-Literacy.W.6.1a Introduce claim(s) and organize the reasons and evidence clearly.
- CCSS.ELA-Literacy.W.6.1b Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.

Name of Evaluator: Kelly Kawalek
Title of Evaluator: Language Arts Supervisor
Date of Evaluation: 4/30/13

After reviewing the "Egg Proj-chick" lesson plans, please respond to the following questions:

- 1) Did the lesson plans collectively address the main standard and its sub-components, as listed above?

Yes No Partially

Comment (optional):

It would be interesting to analyze the pre-post data and consider students with behavior or focusing ~~on~~ issues. Do the data mirror what research indicates?

- 2) If the writing teacher were given permission to hatch eggs in school, would these lesson plans be feasible?

Yes No Partially

Comment (optional):

The use of animals in the classroom must get building (OVER) and Board approval because of the increase of students with asthma and allergies.

Feel free to add any further comments about the "Egg Proj-chick" argumentative writing lesson plans in the space below: