2019

Integrating movement in the elementary classroom: Creating innovative materials that incorporate movement with content areas

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INTEGRATING MOVEMEINT IN THE ELEMENTARY CLASSROOM: CREATING INNOVATIVE MATERIALS THAT INCORPORATE MOVEMEMENT WITH CONTENT AREAS

A Thesis Submitted

In Partial Fulfillment

of the Requirements for the Designation of

University Honors

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May 2019

INTEGRATING MOVEMENT IN THE ELEMENTARY CLASSROOM: CREATING INNOVATIVE MATERIALS THAT INCORPORATE MOVEMENT WITH CONTENT AREAS

This study by: Hannah Harrison

Entitled: Integrating Movement in the Elementary Classroom: Creating Innovative Materials that Incorporate Movement with Content Areas

Has been approved as meeting the thesis or project requirement for the Designation University Honors

_____	_____
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_____	_____
Date	Dr. Jessica Moon, Director, University Honors Program

Acknowledgements

First, I would like to thank my thesis advisor Denise Tallakson. She has provided me with endless encouragement and support throughout the writing of my thesis. Her passion for teaching is apparent, and her experience with art integration in the elementary classroom gave me so much insight into this topic. I enjoyed working with her and was able to learn so much from her own experiences.

Next, I would like to thank Dr. Jessica Moon and the Honors Program Staff for assisting me throughout my time at UNI. I always knew where to ask a question, get advice, or learn about opportunities within my field of study.

Finally, I would like to thank my friends and family for supporting me in everything I do. They have held me accountable, showed interest in my studies, and encouraged me every step of the way to becoming an educator. I am grateful to be surrounded by so many supportive friends and have a family that believes in me.

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Abstract

Movement is an aspect of teaching that often gets left out of curriculum and lesson plans in the elementary classroom. However, brain research and educational studies show that movement can play a critical role in understanding. The goal of this study was to determine how educators can use movement to enhance lessons that are already being taught during the school day without needing extra materials, time, or money. Resources and activities were compiled, organized, and aligned to content standards in order to give educators ideas of ways to modify lessons to incorporate movement. The findings can be found on a website page to serve as a tool for teachers. Major themes of this study were the most common use of movement currently in the classroom is brain breaks, resources for integrating movement with lower grade levels are typically easier to find, and movement in the classroom can result in healthy habits outside of school. The purpose of this study was to explore the benefits of movement and to create innovative materials for elementary teachers which help to integrate content areas with movement. There are so many benefits of getting students out of their seats during the school day, and integrating physical activity with content areas can be an effective way to do so.

Introduction

There are about seven hours in the average elementary school day, only 180 days in a school year, and an endless amount of content to teach. With standards to cover, the pressure that comes with testing, having high expectations for students, and goals of getting children prepared for the next grade, students are found at their desks for a majority of the school day. Students are expected to sit still with voices off until a recess or break in the day. In my time as a student myself, I have found ways I study and learn best, which includes taking short breaks, getting a workout in each day, and switching up my form of studying once in a while. Over time I have found personal benefits of getting movement in each day, but it took time to develop this realization. Elementary educators have a big influence on children and the habits they develop. Perhaps integrating movement in the classroom early on could lead to increased academic performance and lifelong healthy habits.

The purpose of this study was to explore the benefits of movement and to create innovative materials for elementary teachers which help to integrate content areas with movement. Research was examined on the various benefits of physical activity in the classroom. Innovative materials were created that integrate movement with the core content areas of literacy, math, science, and social studies. Brain breaks and classroom management were also considered. The findings of this study can provide educators with a resource that allows them to integrate movement into their elementary classroom without taking time away from the day or needing extra funding. The suggestions and ideas for integrating movement with content areas are available on a Wix website page designed as a resource for myself and other educators.

Literature Review

This literature review was comprised of the following categories: the benefit for movement in the elementary classroom, existing research and practices of integrating movement, the challenges educators face with using movement in the classroom, and how movement can be incorporated while still teaching content areas at the same time.

Benefits of movement in the elementary classroom

Elementary students remain mostly sedentary throughout the school day even though research shows us that movement at a young age enhances learning, is good for the memory, and creates healthy habits. Reed, Einstein, Hahn, Hooker, Gross and Kravitz (2010) discussed how the brain is activated during physical activity by increasing blood flow to essential areas that stimulate learning. In their study, teachers were trained to incorporate movement in their classrooms and examine academic achievement and fluid intelligence, the ability to reason quickly and abstractly. Results from their study found that aerobically trained or physically active participants performed significantly better on the fluid intelligence task than untrained or inactive participants.

Not only does movement in the classroom increase achievement in the classroom, but it also promotes healthy habits that will help to prevent disease later in life. Cothran, Kulinna, Garn (2010) explain that many children are physically inactive and become even less active as they age. The nation has negative physical activity and health trends, and schools are one way to make a difference. Children all across the nation are at risk for serious medical conditions later in life such as high blood pressure, heart disease, and diabetes. When students are able to stand up and move around throughout the day, their heart rate increases and blood flows to the brain

(Lengel and Kuczala, 2010). By getting students up and moving in the classroom, they will see that being active is not difficult or time consuming. If movement is incorporated into elementary classrooms and active lifestyles are discussed, students will be more likely to continue living out healthy habits later in life.

Other students simply learn best by moving. Ratey (2008) explained that kinesthetic learners learn best through movement because the way we think, learn, and remember can be directly influenced by the physical movements in which we participate. As Lengel and Kuczala (2010) put it, when movement is used to learn a new concept, a unique environmental note is made by the brain, making the information easier to recall. It is possible for the brain to create unique environmental pictures of learning, which can enhance students' ability to recall information later. Just as some students learn best visually or auditorily, others learn best kinesthetically.

Movement is an element which helps the brain to process information being taught. The hippocampus is a part of the brain responsible for our memory system, including the working memory. It is believed to be able to hold information for about 20 minutes, and organizes what information should be transferred to our long term memory (Hammond, 2015). As the heart rate increases, blood flow to the brain also increases. When students are active, proteins in the brain are released which nourish brain cells (neurons). Neurons are what carry the information we learn (Dana Foundation). As Keppermann (2010) explained, new neurons are generated throughout life in this region (hippocampus), providing the functional backbone for learning and memory. When neurons carry information, neural pathways are created, which helps the information we learn in our working memory to be transferred to our long term memory. When

information is stored in our long term memory, we are able to remember the things we learn better and can retain the content that is taught.

The brain processes and organizes information through the working memory (in the hippocampus). It is during this stage that teachers should introduce responsive processing tools such as movement, repetition, story, metaphor, or music to help the brain process information. The brain then begins going through a set of cognitive routines that activate the "firing" of neurons and triggers a cascade of chemical and electrical impulses. If music, movement, or some other element is used to help process the information, the neurons will connect the new information to what the brain already knows. This will help new connections to be made and will allow students to understand what is taught more deeply and retain the content better (Hammond, 2015).

Children generally cannot concentrate for more than 15-20 minutes (and it is not much more for adults). Movement reinvigorates concentration and provides a brain stimulus that increases attention, focus, and boosts academic performance (Cornett, 2015). More active kids have more energy, which helps to clarify thinking and be more productive in the classroom (Science Daily, 2006).

Existing research and practices of integrating movement

Programs have been put in place around the country to incorporate movement in the classroom. As Kibbe, Hackett, Hurley, McFarland, Shubert, Schultz, and Harris (2011) explain, one of these programs was TAKE 10! which was an intervention plan designed to reduce sedentary behavior without sacrificing time to academic learning. With this program, willing teachers incorporated one to four activities per week. Some examples of lessons included third graders learning multiplication tables by doing invisible jump roping and second graders

practicing contraction by singing and performing two-part muscle contraction movements. The results of this intervention were positive, and investigators reported improvement in different measures of academic performance.

Although some programs are intended to be used during the school day, other programs are used as before or after school programs. The *Let's Move* initiative explained how some schools use before and after school programs or open school facilities for student and family recreation in the afternoons/ evenings in order to promote healthy lifestyles and to help kids to physically active. Getting the families involved can be beneficial as well, so students can begin transferring these healthy habits to their home lives as well.

Other teachers use movement by incorporating brain breaks throughout the day. Jensen (2000) explained that our brains are designed to learn short bursts of information followed by time to process the information, which allows for memory formation. One way to encourage this is to provide spaced intervals or breaks throughout the school day to give students time to move. Perera, Frei, and Bobe (2015) also discussed the importance of brain breaks. A study was done to see the results of implementing brain breaks in the classroom. A 5-7 minute exercise DVD was created that students and teachers could follow along with to create simple, safe movements, storylines, music, and creative backgrounds to engage the students on multiple sensory levels. The prepared brain breaks promoted movement and were engaging to students, but limitations included competing academics, inadequate training, and preparation time. Other brain breaks commonly used include *Just Dance*, Rock Paper Scissor competitions, creating handshakes with a partner, and playing Simon Says. Although brain breaks provide time for students to get up and be active, no content is typically being taught which takes away from valuable instructional time

during the day. The primary goal of all brain breaks is to give the brain time away from the academic content (Lengel & Kuczala, 2010).

Some schools simply use Physical Education (PE) or recess time as their only way of using movement. PE and recess are both great, but should not be a student's only break or chance to get up during the school day. Most schools are on a specials rotation, and only have PE a couple times a week, and many recesses are getting shortened and cut.

Challenges teachers face with using movement in the classroom

Integrating movement has numerous benefits, but there are also many challenges educators face with using it in the classroom. The first major challenge is the time it takes. There is limited time in a school day, and lots of content to get through. Holt, Bartee, and Heelan (2013) expressed concern about the amount of information that has to be covered in a single day. This can be overwhelming for educators as it is, and even more so when told they should add movement to their schedule as well. A lot of curriculum that is taught has become narrowed to "teaching to the test" because there is so much pressure around high test scores. This leaves little time for physical learning and movement in the classroom, and results in students sitting for a majority of the day (Cornett, 2015).

In a study by McMullen, Kulinna, and Cothran (2014) student behavior and classroom management were threats to integrating movement. After students have been sitting all day, it is typical for students to become rowdy and squirrely when given the opportunity to get up and move around. Safety concerns can also go along with this. Just as it is important to consider students' safety and risk management with any lesson being taught, it is even more important to recognize when integrating movement due to limited space, many obstacles, and increased

movement. Classroom management plays a huge role and must be effective before movement can be incorporated.

Although intervention programs have been put in place in various schools around the nation to integrate movement and improve the health of students, there can be challenges with these programs as well. Story, Nanney, and Schwartz (2009) suggest that there is often limited funding to implement new programs. Programs also require teacher acceptance and training which can be a big obstacle.

How movement can be incorporated while still teaching content areas at the same time

Marcia Daft (2011) found ways to teach mathematics to grades K-2 while incorporating movement. Rather than teaching physical activity and mathematics separately, she provides ways of incorporating the two areas to create a more enriching experience for students. Through body movement, Daft is able to teach students about spatial relationships and shapes. Daft also provides ways to teach number comparisons while having students standing up and working together. Other mathematical concepts addressed through movement include remainders, sequencing numbers, more than/ less than, skip counting, and place value. This is all content that comes up in elementary math standards and is important for students to understand. However, there are ways to teach these concepts in a more enriching, active way.

Claudia Cornett (2015) also provides ways to incorporate physical activity with content areas such as math, literacy, social studies, and science. Cornett shows that it is possible to teach the required content areas that show up in standards, while getting students up and moving. She presents ways to incorporate literacy concepts such as rhyming, syllables, spelling, and parts of speech while having students be active. Math concepts presented are geometric shapes, telling time, angles, and more. Students are able to represent geometric ideas by walking the outline of

shapes and making angles with their arms. Social studies can be taught through movement as well. Some concepts addressed by Cornett include culture, foreign language, geography, holidays, and current events. Science standards that can be met through movement include concepts such as the environment, science vocabulary, animals, endangered species, and water.

Research Questions

Several questions guided this study. 1) What are examples of ways movement can be incorporated while still covering the standards/ content and preparing students for assessments? 2) Are there any areas or subjects that should not be integrated with content? How can educators know when to use it? 3) Brain breaks are one of the most common ways to use movement in the classroom. What is the most appropriate place for brain breaks in a classroom? When should they be used, if at all?

Methodology

This study explored elementary content standards for math, literacy, social studies, and science, while aligning these subject areas with activities that incorporate movement. This qualitative review included these content areas because they are the four subject areas described in the Iowa Core. They are also the subjects taught be general elementary education teachers. Activities were chosen based on standards in the Core, and can be easily modified to tie with other grade levels or lessons. The movement used in the resources include general movement (not being stationary, moving up/down, or moving to another place) and physical activity (voluntary movements that use energy). Exercise movements were left out, as this is the type of movement typically used in physical education classes with the primary goal of raising the heart rate. The purpose of integrating movement in the general elementary classroom is to increase

academic achievement and understanding of content, so activities containing general movement and physical activity were primarily highlighted in this analysis.

Findings

Through exploring various curriculums, educational books, and scholarly websites/ articles, it was found that movement can be used to teach all four content areas of the Iowa Core. Math, Literacy, Social Studies, and Science activities can all be aligned with standards in grades 1-6, while getting students up from their desks and moving.

Content Area: Math

This section will outline the findings of resources that can be used to incorporate movement with math standards.

1st Grade Standard: (1.MD.B.3**)** Measurement and Data: Tell and write time in hours and half-hours using analog and digital clocks.

Aligning Activity: **(**Cornett, 2015**)** Telling Time: Use tape to mark a large circle on the floor. Mark the hour ticks. Have groups of students work together to represent various times with their bodies.

2nd Grade Standard: (2.NBT.A.2) Number and Operations in Base Ten: Count within 1000; skip-count by 5s, 10s, and 100s.

Aligning Activity: (Daft, 2011) Skip Counting by 5s and 10s: Students stand up, spread across the room. Each student puts one hand in the air. The teacher calls out how many groups to make. If the students are to make groups of 2, 2 students group together. First they are directed to count each finger on their hands (to see that there are 5). Then, in order to determine how many fingers there are between them they must count by 5. The teacher calls out different numbers of

groups, slowly building up to larger numbers. Eventually the class can make one big group that they must skip count. This activity works well for skip counting by 5s and 10s.

3rd Grade Standard: (3.NF.A.1) Number and Operations- Fractions: Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

Aligning Activity: (Lengel and Kuczala, 2010) Human Fractions: Give half of the class blue headbands and half of the class red headbands. Have fraction cards prepared (numerators in red and denominators in blue). Divide the class into two teams, so that each team has an even number of blue and red people. Hold up a card. Each group will create a human fraction that represents the fraction on the card. The group that creates the fraction first gets a point. Discuss each problem with the group, especially if the groups have different solutions.

4th Grade Standard: (4.OA.A.1) Operations and Algebraic Thinking: Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

Aligning Activity: (Everyday Mathematics Curriculum, 2014) Beat the Calculator: Students are in groups of 4. One player is the caller, another is the calculator, the third is the brain, and another is the runner. The caller places the deck of math flashcards number side down and draws a card from the top. The caller also draws a card with a movement on it (jumping jacks, dance moves, etc.). The calculator solves the problem either mentally or with paper/ pencil, the calculator solves the problem with a calculator, and the runner must complete the task on the movement card. The player who gets the correct answer/ done with the movement first gets the cards. Rotate roles every few turns so everyone gets a chance to do each role.

5th Grade Standard: (5.MD.A.1) Convert like measurement units within a given measurement system: Convert among different–sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi–step, real world problems.

Aligning Activity: (Everyday Mathematics Curriculum, 2014) Estimating the Ground Level Area of the School: Students will find the area of their classroom and the perimeter of the school by first finding the length of their strides and walking along the walls/ outside of the school. Have students measure real objects and lengths around the school.

6th Grade Standard: (6.EE.B.7) Expressions and Equations: Solve real-world and mathematical problems by writing and solving equations of the form x+p=q and px=q for cases in which p, q, and x are all nonnegative numbers.

Aligning Activity: (Summerford, 2009) Math Circuits: Set up stations with a math problem and a movement card at each station. Students will go to a station and complete the math equation. Once the student figures out the answer they will do the movement on the card the amount of times as the answer. Movement cards might include number of jumps, volley balloons, underhand toss balls at a target, etc.

Content Area: Literacy

This section will outline the findings of resources that can be used to incorporate movement with literacy standards.

1st Grade Standard: (RF.1.3) Reading Standards- Foundational Skills: Know and apply grade- level phonics and word analysis skills in decoding words.

Aligning Activity: (Summerford, 2009) Phonics 4 Phitness: There are three sets of 26 plates with letters written on each plate. The teacher scatters the plates around the room. The

teacher will call out a series of questions regarding phonics and a basic locomotor skill. The children perform the movement as they travel to the correct plate. Ex. "Hop to the letter that makes the *huhh* sound like in the word house."

2nd Grade Standard: (RF.2.3) Phonics and Word Recognition: Know and apply grade-level phonics and word analysis skills in decoding words.

Aligning Activity: (Journey's Curriculum, 2019) Spelling Hopscotch: Create a hopscotch pattern on the floor with tape. Write one letter from spelling words in each box and then write the whole word at the top. Invite children to hop from one letter to the next, saying each letter to spell the word. Have them say the word.

3rd Grade Standard: (L.3.5) Vocabulary and Acquisition Use: Demonstrate understanding of word relationships and nuances in word meanings.

Aligning Activity: (Journey's Curriculum, 2019) Synonyms: Write the words "walk" "creep" and "sneak" on the board. Discuss how all three words have similar meanings and that this is called a synonym. Explain that little differences in words can make a big difference. Have students act out "walking" then "creeping" (crouching near the ground as they move), then "sneaking" (walking secretive). Discuss what was similar and what was different about their movements.

4th Grade Standard: (RF.4.3) Phonics and Word Recognition: Use combined knowledge of all letter- sound correspondences, syllabication patterns, and morphology (roots and affixes) to read accurately unfamiliar multisyllabic words.

Aligning Activity: (Summerford, 2009) Absolutely Adverbs: Students move around the classroom doing the movements you say. They will alter the way they are doing the skills by listening to the adverbs being called out. For example, students begin walking but when the

teacher calls out "quickly" they will begin walking quickly. Other words that can be used are nonchalantly, quietly, loudly, carefully, etc. Change the locomotor skills and adverbs to best suit students.

5th Grade Standard: (RI.5.3) Key Ideas and Details: Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

Aligning Activity: (Cornett, 2015) Character Walk: After reading a historical, scientific, or technical text, have students work in pairs or groups. Each student should choose one character in the text to act out. Students within each group will walk and interact with one another in the manner that the person in the reading did. Encourage students to use various levels, postures, rhythms, moods, etc. At a "change" signal, each student should try a variation of the walk (perhaps another moment of the person's life).

6th Grade Standard: (RL.6.3) Key Ideas and Details: Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves

Aligning Activity: (Cornett, 2015) Moving Tableau: Challenge small groups to use their bodies and space to show a key story or text concept. Freeze in the shape. On signal, each person unfreezes and moves to the next scene. Display how different characters respond to different events in the story.

Content Area: Social Studies

This section will outline the findings of resources that can be used to incorporate movement with social studies standards.

1st Grade Standard: (SS.1.21) Analyze Change, Continuity, and Context: Compare life in the past to life today within different communities and cultural groups, including indigenous communities.

Aligning Activity: (Cornett, 2015) Real-Life Rituals: Brainstorm ritual movements from various cultures students have learned about. These can be greeting and farewells. Divide students into pairs to act out these rituals using different body parts, space, energy, time, etc. Have students discuss the differences of how we greet each other today (informally sometimes, often using technology, etc.) versus how other cultures greeted each other (some are very formal, handshakes, bows, etc.)

2nd Grade Standard: (SS.2.16) Creating Geographic Representation: Using maps, globes, and other simple geographic models, evaluate routes for people or goods that consider environmental characteristics.

***Aligning Activity*:** (Lengel and Kuczala, 2010) Cardinal Directions: Pretend the classroom is a map and students are the compasses. When "north" is called out, students will walk to the wall labeled north. Students will move from one direction to the next.

3rd Grade Standard: (SS.3.28) Iowa History: Explain the cultural contributions that different groups have made on Iowa.

Aligning Activity: (Cornett, 2015) Get to Work: Brainstorm ways people have worked or contributed to the community in Iowa over time. For example, washing, picking, sweeping, fixing, farming, etc. have small groups create a dance or movement base on work that Iowan people have done. Props can be used if needed, but moves should be creative. If time allows, have groups present to the class and have the class guess what contribution/ work they are demonstrating.

4th Grade Standard: (SS.4.22) Critique Historical Sources and Evidence: Infer the purpose of a primary source and from that the intended audience.

Aligning Activity: (Cornett, 2015) Historical Event: After reading a historical document, such as the Declaration of Independence, have students explore various movements that could have been a part of that event. For example, what did the people (audience of the document) do or react based on the signing of the document? How did the writer or signer of the document react or move? Encourage students to create the mood of the event with movement, body shapes, different speeds of motion, and space.

5th Grade Standard: (SS.5.13) Critique and Exchange Markets: Describe how goods and services are produced and distributed domestically and globally.

***Aligning Activity*:** (Lengel and Kuczala, 2010) Supply and Demand: Split up the class into groups of producers and consumers. Give the producers each one ball. Have them decide on a price for each product. Then the consumers will buy a ball (producers will throw it to them). Give the producers more products to sell. Have the supply and prices change to represent supply and demand. Show what happens when there is an excess of goods and when there is more demand than supply.

6th Grade Standard: (SS.6.22) Justify Causation and Argumentation**:** Explain multiple causes and effects of events and developments in the past.

Aligning Activity: (Lengle and Kuczala, 2010) Understanding a war: Role play a war with a tag game. If the two sides were unequal due to sizes of armies/ power, give one team more players. If one side had more resources or geographical advantages, allow one team to run and the other team to walk. After the game, have a class discussion about the effects geography, population, and other factors have on wars and power.

Content Area: Science

This section will outline the findings of resources that can be used to incorporate movement with science standards.

1st Grade Standard: (1.ESS1.1) Earth and Space Sciences: Use observations of the sun, moon, and stars to describe patterns that can be predicted.

Aligning Activity: (Summerford, 2009) Planet (Sun, Moon, and Earth) Catch: This activity can be used to teach the different planets or the rotation of the sun, moon, and earth. A cone/ object will be placed in the center of the room to represent the sun. Have students stand around the sun to represent different planets (or the moon). If available, have students hold balls to represent the sizes of the different planets (sun is largest, earth is medium, moon is small). Then, have the students orbit around the sun. Discuss the difference in time it takes for the planets to make one orbit. Have children turn around as they move in their orbit to demonstrate the planet rotation and why we have day and night. This activity can be done with a variety of locomotor skills.

2nd Grade Standard: (2.LS4.1) Biological Evolution- Unity and Diversity: Make observations of plants and animals to compare the diversity of life in different habitats.

Aligning Activity: (Cornett, 2015) Think Like a Scientist: Students begin by brainstorming the characteristics of different animals (slithering, swimming, etc.). Pair students up. One student in the pair is the animal and the other student is a scientist (someone who makes observations and collects data). The animal chooses an animal and uses one of the brainstormed characteristics to act out the character. The scientist records what is seen (not yet guessing the animal) and makes assumptions about the habitat the animal lives in. Students switch roles. If time allows, have students perform for the class.

3rd Grade Standard: (3.ESS2.2) Earth's Systems: Obtain and combine information to describe climates in different regions of the world.

Aligning Activity: (Cornett, 2015) Environmental Walk: After discussing different details of various places in the environment, group students up. Write challenges on cards and give each group a different one to plan/ perform how you would walk in a given environment. The rest of the class describes the conditions they observed. Examples of conditions could include beach with hot sand, a thick forest, soggy marsh, rocky path, etc. If students catch on quickly, add environmental problems that would change the walking conditions. Environmental problems may include oil spills, broken glass, or trash on a prairie.

4th Grade Standard: (4.PS4.1) Physical Science: Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

Aligning Activity: (Lengel and Kuczala, 2010) Traveling Waves: Divide the class in half and have them stand in line across from one another on either side of the room. On one side, the students should stand shoulder to shoulder (close equals dense material), and on the other side students stand an arm length apart (farther apart means less dense material). This provides a visual for what it means to be dense. Next, have students all put their hand in front of them with their palms up. Have the students tap one another's hands going down the line, simulating a seismic wave traveling through the earth's core. Students will see how denser material affects the speed of the movement. Have students switch roles to experience how fast and slow the waves travel based on the density.

5th Grade Standard: (5.LS2.1) Ecosystems- Interactions, Energy, and Dynamics-Life Science**:** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Aligning Activity: (Lengel and Kuczala, 2010) Producers, Consumers, and Decomposers Tag- The Food Chain: Divide the class into three groups (plants, prey, and predators). Use the classroom as the "environment". Students must move as their role would move, so plants must stay in place but can move with their arms/ sway. The prey work to tag everyone else. When the prey are tagged, they go to the side of the room and decompose (break down and shrink). When all of the prey are decomposing, the game starts over. Let students switch roles. Discuss what is happening to the matter and how these different groups interact in various environments.

6th Grade Standard: (MS.PS1.4) Matter and Its Interactions: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

Aligning Activity: (Cornett, 2015) States of Water: As a class, discuss how particles move in different states (solid is slow with little space between, liquid is medium speed and is a sliding motion, and gas is fast with lots of space in between). Explain to students that they will use different parts of the body and the space in the classroom to represent different molecular movements. Call out different changes such as melting, condensing, and evaporating. Explore what happens when solids change to a liquid or a gas.

Summary of Findings

The ideas included in this study all integrate general movement or physical activity, which gets students out of their desks and moving to get blood flowing. Although the lesson ideas were categorized by grade and content area, many of the activities can be modified to align with different grades or standards. Some of the lessons came from curriculum guides, but others can be used to modify lessons that are prewritten into curriculum.

Throughout the compilation of activities and the alignment to standards, it became apparent that resources seem more easily accessible for younger grade levels. Although younger children are often known for having more energy and need to move, upper elementary students can benefit from movement just as much. By creating these healthy habits at a young age and in lower elementary classrooms, students will be more likely to use these ideas in later grades and outside of school. This can create healthy lifelong habits and allow students to explore how they learn and focus best.

Classroom Management. Since students are to be up and moving in these activities, it is important that teachers are able to manage students and keep control of the classroom. Although there are numerous activities and resources to encourage learning through movement, each class is different. These ideas should be used to build off of and modified to fit individual class needs. (Lengel and Kuczala, 2010). Students may not be familiar with using movement in the classroom, so the expected norms should be taught ahead of time. Weinstein (2015) explained, teaching students how to carry out behavioral routines is much like teaching them how to add or subtract. Research shows that effective classroom managers explain and demonstrate procedures, allow students to practice them, provide feedback to students about their performance, and then reteach the procedures if necessary. Such thoroughness is particularly important at lower grade levels when children have had little experience with the routines of school and when new instructional strategies are introduced. By defining how students should behave in specific situations (such as using movement) ahead of time, instruction time will be more productive.

Resource Guide Website

After finding resources and activity ideas to incorporate movement with elementary content areas, I designed a page on my education Wix website. This page is intended to guide

myself and other educators to use movement in the classroom. The page includes the four subject areas and an example of movement integration for each grade (1-6). Each activity aligns with a standard to ensure appropriateness for each grade level. The activities listed are intended to be modified and can be used across several grades. This is by no means a cohesive curriculum guide, but rather a starting point to integrate movement in the general elementary classroom. For a preview of this page, visit https://harrisoh8.wixsite.com/website.

Conclusions

This study was conducted to see how educators can use movement in the elementary classroom in order to enhance student understanding, without losing instruction time or using extra funding. The results from this study suggest that it is possible to incorporate movement with math, literacy, social studies, and science without losing class time. Incorporating movement creates a more enriching and engaging experience for students, and will give kinesthetic learners the support they need to succeed. Integrating movement benefits all students and promotes a positive, collaborative environment, while teaching healthy habits that students can use later in life.

Elementary educators have so much influence in the lives of their students, so encouraging healthy habits in the classroom can leave a lasting impact. If students are engaging in active learning at school and being taught healthy habits, they are more likely to maintain these behaviors at home and in later years. Another way to promote healthy and active lifestyles outside of school is to get parents/ guardians of students involved. By having good communication, families will be more aware of what is happening during the school day, and how they can best support their child outside of school. Homework can be a tool to support additional learning and understanding at home, but active living can be supported at home as

well. Make families aware of the integrated movement in the classroom and provide ways students can be active outside of the classroom. This will promote healthy habits outside of school as well.

One of the most common current uses of movement in the classroom are brain breaks, or a break from academic content by getting students up and moving. Interactive games, handshakes, dance breaks, and short exercises are often used as brain breaks. The purpose of brain breaks is to give the hippocampus (the part of the brain responsible for the working memory) an opportunity to process the information taught. The working memory can store information for about 20 minutes, so a break from content is said to be beneficial in the retention of information. Getting blood flowing for a short period of time is a good thing, especially when it comes to learning, but if the goal is high academic achievement and the retention of information taught, taking time away from instructional content is not always the most beneficial. There is already limited time in the school day, and teachers are often rushed to get through all of the content as it is. Although brain breaks can have a time and place when used appropriately, more benefits may actually be seen when movement is integrated with lessons already being taught.

Resources for integrating movement with lower grade levels are typically easier to find, as younger children are often known to have more energy and more need to move. However, movement is just as beneficial for upper elementary students as well. Older students are able to begin recognizing how they learn and focus best, and can begin creating habits that will continue on after their elementary years. Many upper elementary students also get little or no recess compared to younger grades, which is another reason they should be up and moving in the classroom. Many activities which incorporate movement can be modified for older grades but

must be looked at with a critical eye. Although movement is so beneficial for elementary students, it is not realistic to use it in every lesson. When choosing teaching strategies, a variety of factors should be considered such as how much content is being taught, how long students have been sitting that day, and how students behave and respond to movement. Classroom and risk management should be considered when planning for movement. Every class will respond and behave differently so it is important to set expectations from the beginning.

Some limitations of this study include the selection of resources and activities in the findings. There are other curriculums, books, and educational resources that include activities which incorporate movement. Further analysis could be conducted to find resources that align to additional standards, and which apply to higher grade levels. Further research could also be done to explore the benefits of movement for students with learning disabilities or adverse childhood experiences. Mindfulness and other forms of art integration could also be explored.

With limited instructional time in an elementary school day, movement should be used when it is able to enhance the content already being taught in order to create a more enriching learning experience. The goal of integrating movement is higher academic achievement and retention of content taught. Students will also begin to create effective study habits and healthy lifestyles they can continue to use later in life. Movement has the potential to benefit all students academically, increase engagement in the classroom, and promotes active living.

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