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The Importance of Physical Activity

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Abstract

The Capstone Research Paper discussed the importance of Physical Education in the elementary school level. The participants for the Capstone Project included 20 fourth-grade students in a private school located in California's Santa Cruz County. The Capstone Project applied the fourth-grade students multiplication skills in a Physical Education format. The observer took two weeks to complete this project during the students' Physical Education class. The Capstone Project was an overall success; the students met the learning objective of the lesson. The observer found that the students responded better to doing multiplication when presented in a physical activity format. The students preferred working with partners when completing the assessment, rather than individually. The Capstone Project connects to the observer's career path because she is able to find ways to incorporate physical activity in different lessons being taught throughout the entire school day.

Keywords: Physical Education, Physical Activity, Academic Achievement, Multiplication skills

Physical Activity

Physical Education, also known as physical activity, is seeing a decline in elementary schools. Students are required to have at least 60 minutes a day for physical activity. This milestone, however is not being reached due to a lack of schools' participation. There are a variety of reasons for this: two of the most significant are budgetary challenges, and the perception that students should behave at school by sitting quietly throughout the whole day. These schools, however do not realize that physical activity should not be seen as competing with academics, but instead as an important source of support for an enhancement of schoolwork, particularly for young children. The following Capstone paper will focus on the importance of physical activity in elementary school and discuss how teachers can integrate physical activity into their daily teaching.

Importance of Physical Activity

Physical activity has been shown to have many benefits when it comes to students' academic achievements and their overall performance in school. According to Conyers and Wilson (2015), as well as, Brusseau (2015), physical activity helps improve students' cognitive skills and behavior in the classroom as well as enhancing and supporting concentration. It has also been shown that students who participate in physical activity perform better on school tests in a wide range of subjects, including math, reading, science, and spelling. Conyers and Wilson (2015) found, "that nine to ten-year-olds performed better on reading comprehension, spelling and math tests when they had twenty minutes of physical activity immediately before testing" (p 2). This demonstrates the benefit of even a very limited amount of physical activity on the performance of students. Brusseau (2015) found similar results when observing elementary students participating in physical activity. Brusseau (2015) stated that, "elementary school-aged

girls performed better in math and reading when they had additional physical activity time” (p. 1). As you can see these two authors arrived at similar conclusions: physical activity in schools should not be seen as something bad, but rather as something that is good for students to participate in on a daily basis.

The Physical Fitness Guidelines, students should have at least 60 minutes of physical activity per day. The reasons are varied, the most obvious being the prevention of obesity in elementary students and promoting physical wellness in general. Physical activity also benefits the student’s performance in class. Sachek’s (2015) article addresses the issue of schools eliminating physical activity programs from their schools because of budget. At a school in Boston, “Only 17 percent of the state's high school students reported being physically active 60 minutes or more every day” (Sachek, 2015, p 1). This is only seen in schools throughout Boston. Lorenz (2017), discussed how schools are focusing on the academics portion of school to the extent that physical activity is being highly reduced. “Increased emphasis on academic outcomes has reduced the amount of time spent in physical education and other school physical activity opportunities in many schools in the USA. Physical fitness, however, is a positive predictor of academic performance on standardized tests, and students who perform better on fitness measures may earn higher grades” (Lorenz, 2017, p 2).

The increase in physical activity among the students seem to have had a clear benefit on their academic performance. Lorenz (2017) took her research a step further by trying to determine if a students’ ethnic background, physical fitness and body mass index had a causal connection with their performance in school. It did not. Physical fitness was the main reason why students performed well in these areas and overall academic performance had nothing to with the other factors listed.

The Robert Wood Johnson Foundation (2007) discussed the importance of physical activity in school-aged children in general, and specifically analyzed why they should have least sixty minutes per day of exercise. The article addresses how schools are eliminating physical education due to lack of budget, as well as because they are demanding time for more academic subjects. Trost (2007) stated, “sacrificing physical education for classroom time does not improve academic performance” (p 2). The author, throughout the article discussed how students who participated in a physical education class or activity performed better than students who were in a control group. Trost (2007) implies that any amount of physical activity throughout the day can help with concentration and behavioral performance. Performance in Math and English, for instance, improved after students engaged in physical activity. “Adolescents who reported either participating in school activities, such as PE and team sports, or playing sports with their parents, were 20 percent more likely than their sedentary peers to earn an “A” in math or English” (Trost, 2007, p 2). These numbers have shown change throughout the years but 2006 was the point at which schools began to notice a change in students’ academic performance.

Snyder, Dinkel, Schaffer, Hiveley and Colpitts (2017) discusses how some students are classified as kinesthetic learners, meaning they learn better through touch, movement and hands-on assignments than through the conventional classroom approach of reading and listening. The authors believe that physical activity in the classroom will enhance students’ attention and comprehension. The simple act of walking, for example, is one way teachers can allow students to get some steps in before the next lesson is to be taught.

Ratey (2008) has a similar approach to Snyder (2017) where he also believes the importance of working out before school starts in order to enhance mental ability and reading comprehension and retention. In his book he describes how the classroom in zero period is made

up of treadmills and stationary bikes. During the course of the school day, students are to finish a lesson and then run a lap around the field. The teacher then tells them to take a literacy test to see if exercising before class truly helps retain the information given to them throughout the day.

Two students find that exercising before school starting really helps them stay awake and focused throughout the day. The author states that the purpose of this classroom is to teach students about the paramount importance of staying healthy, and helping them make it a lifestyle. Getting students up and moving is part of the teaching process.

Integration of Physical Activity

Physical education should be introduced to students before they begin attending school. It should begin around the age of three. Children, at this age should be introduced both to the idea of physical activity and why it is important. Once students begin attending school, teachers often view physical activity as an impediment to other important classroom activities. They do not realize how much a student can benefit from at least five minutes of movement (Brusseau, 2015). Physical activity can help by allowing students to have the opportunity to move around and have free-play. This will then improve students' behavior in class as well as increase their concentration (Conyers & Wilson, 2015).

Benjamin (2013) discusses how physical activity can be incorporated into every school day with the proper instruction by teachers and use of the proper equipment. Benjamin (2013) states, "Small steps can make a big difference. For example, increasing the time children spend outside, providing portable play equipment (e.g., balls, jump ropes, and tricycles) on playgrounds, and ensuring staff are properly trained to deliver physical activity instruction are ways to get kids moving more in these important settings" (p 3). These basic equipment provided at schools will give the teachers the opportunity to allow their students to take a break in between

lessons. Recess is also a form of physical activity introduced to students at a young age that allows these types of equipment to be used. Recess is an easy way to have teachers ensure that their students are using this break to get out any energy needed before entering the classroom again.

Lindt and Miller (2017) compared two forms in which students are being taught in classroom settings. One was the more traditional form -- students sitting at a desk listening to directions from a teacher at the front of a classroom. The second way was to have teachers integrate movement into their math and reading lessons. Teachers found that exercising the children's bodies through movement between lessons helped improve their attention span and focus during the course of the lesson being taught. They introduced five strategies that would help teachers integrate movement into their classroom. Lindt and Miller's (2017) strategies are "Dancing to learn information; applying movement to content assessment; moving among stations around the classroom; ordering and organizing and representing with action" (p 5). To get teachers to use these methods this paper will give some examples used in the article to show how students can retain the information as well as using their bodies.

Strategy one that Lindt and Miller (2017) presented was "Dancing to learn information" (p 5). Students were learning how to skip numbers during a math lesson. The teacher wanted the students to skip by fives. Many students, however were having difficulty doing so. The teacher then used movement to help students count by five. "For example, when teaching students how to skip count, teachers can use the movements and rhythm from the song "Macarena" to help students count "five, 10, 15, 20" to the beat" (Lindt & Miller, 2017, p 5). Strategy two can be applied to a math lesson when students are learning to skip numbers. Or it can be used as an English Language Arts assessment when students are learning about synonyms and antonyms

(Lindt & Miller, 2017, p 5). Strategy three, “moving stations around the room” (Lindt & Miller, 2017, p 5) is a great way for teachers to use movement in a math lesson or as well as a spelling lesson. It gives the students a chance to walk around the classroom and engage with other students. This type of physical activity in a class also provides the teacher with some ideas on whether their students work better integrating physical activity and math or physical activity and spelling. Either way incorporating physical activity is a way for students to perform better in these subjects.

Strategy four “ordering and organizing” (Lindt & Miller, 2017, p 5) involves students to engage with other students in a math lesson being taught or a reading lesson being taught. The materials used for this are flashcards. Teachers can present the students with different flashcards with different fractions on them. They are asked to find their partner in the classroom. Teachers can use this form of physical activity in the classroom during a reading lesson as well. Teachers use the flashcards again with different words and punctuations on it. The students will then form a line with the correct order of the sentence the cards make. Strategy number five “representing with actions” (Lindt & Miller, 2017, p 5) allows teachers to use physical activity in their math lessons and reading lesson again. For the math lesson students can use their bodies to make a shape the teacher gives them. As for incorporating strategy five into a reading lesson the students can use their bodies to represent any vocabulary words they have learned throughout the chapters they are reading.

Wade (2016) discusses how teachers can incorporate physical education into a mathematics lesson. It specifically addresses children from grades first through fourth, and how physical education allows students to comprehend a lesson being taught through colorful number mats and other forms of physical equipment. The study specifically looked into students using

number mats as a stretching area. The mat allowed students to stretch while getting their brains engaged in the math lesson being taught. The mats also gave the students a sense of calmness and helped them not overthink the concept being taught. Wade believes that this concept can also be incorporated into a physical education class, not always a mathematics lesson. The study shows that students who were engaged in the mats lesson were able to improve their math skills.

Lindt and Miller (2017) were the inspiration for the options. Their strategies explained and gave examples as to how teachers can integrate other subjects into a Physical Education environment. The options chosen for this paper are based off the subjects listed in the Lindt and Miller (2017) article. Option one is how teachers can integrate a math lesson into a Physical Education lesson during their class time. They are able to use the materials already being used to teach the lesson but add a physical activity component. This is a way for teachers to save money and have no cost when integrating the two subjects. The option will be during class time; therefore teachers do not have to give up extra time throughout the day to add physical activity. The teachers are able to measure their students' effectiveness by observing if their students are more focused and engaged when using physical activity to learn the math subject. Option one is also based off the project that will be mentioned later in the paper.

Option two is a way for teachers to integrate a similar lesson from option one but using Spelling instead of math. Students are able to engage in a Spelling lesson using physical activity as a component. This option will not cost anything because teachers are able to use the materials they were originally going to use for their Spelling lesson. It will be during class time, therefore teachers will not have to make time for the lesson. Effectiveness of the lesson can be measured by seeing if physical activity helps enhance students learning. Teachers are also able to test the students Spelling knowledge after the physical activity was over by giving them a Spelling test.

Option three is similar to both option one and two, however teachers are now using Reading as their subject choice to integrate physical activity with. Teachers are able to use class time for this lesson, so they are not taking extra time out of the day for a whole new lesson. The cost is minimal because the students and teachers will already have the appropriate material to engage in the physical activity. Teachers can see how effective the lesson is by observing how the students are able to comprehend the reading material while engaging in a physical activity lesson. Teachers can also measure the students’ effectiveness by assessing the students after on what they read.

Table 1

Options

Option	Cost	Time	Effectiveness
Integrating Physical Activity and Math	No cost	It will be during the teacher’s time in class.	Review students’ math performance during the physical activity.
Integrating Physical Activity and Spelling	No cost	It will be during the teacher’s time in class.	Review student’s spelling performance during the physical activity.
Integrating Physical Activity and Reading	No cost	It will be during the teacher’s time in class.	Review students’ reading performance during the physical activity.

The project for the Capstone will be taking place at a private elementary school in Santa Cruz. The reason the observer chose a private school over a public school is because they were more familiar on how the Physical Education program, as well as, the Mathematics program is being ran at a private school because of their own experience. The students are in the fourth grade. The project will be based off of incorporating mathematics into physical activity. There will be observations made during this time to see if integrating physical activity into an everyday math lesson is beneficial to students' performance in this particular subject area. It will allow the teacher to see if incorporating physical activity into a math lesson something worth doing in order for the students to succeed. The project may also give teachers in idea on how to incorporate physical activity into other subjects being taught. The project will allow insight on if the data is accurate and if students should be having more physical activity throughout the day. During the project, the observer will be working alongside the Physical Education director, as well as, the fourth-grade teacher to go over the lesson plans each teach. The observer will then create a lesson plan of their own to that incorporates the two subjects to work together.

Project

The literature review discussed how public schools were seeing a decline in physical activity due to budget cuts and teachers not seeing the benefits of physical activity. The research presented in the literature review discussed how physical activity is seen as an importance to students' academic achievement, rather than a competitor for their academics. It discussed options on how teachers are able to integrate physical activity into any subject taught throughout the day.

The project will apply the student's multiplication skills in a Physical Education format. Students will have to identify their "missing math partner" in a warm-up using the note cards provided by the observer. Once the students identify their partner, they will be assigned a worksheet to complete with their partner. The second week students will be asked to do the warm-up with their notecards. Once the warm-up is completed students will be assigned a worksheet to work on individually. The worksheet will allow the observer to see how well the students applied their multiplication skills throughout the warm-up.

Design

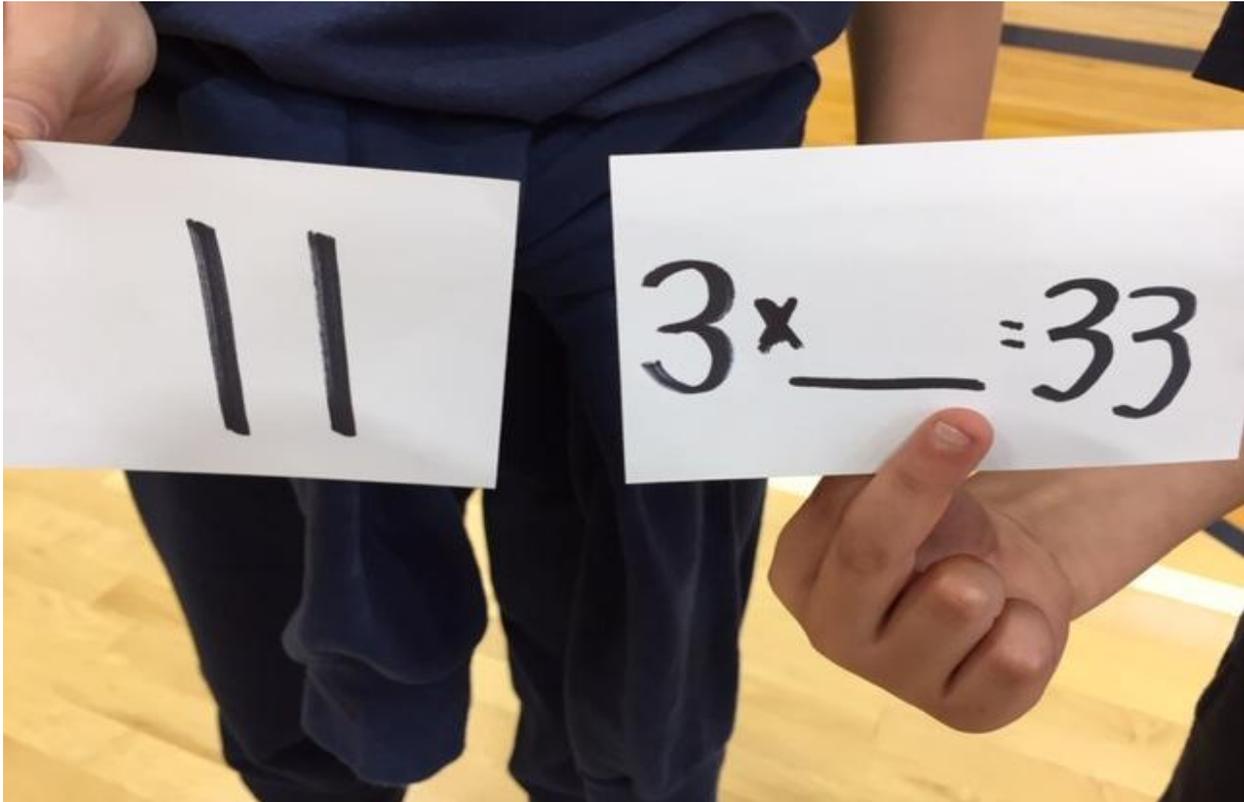
The project is designed to apply the students' multiplication skills to help identify their missing math partner. The reason the observer chose implementing Mathematics into Physical Education is to allow the observer to see if students are more successful in math after doing physical activity. It is designed to give teachers the opportunity to implement physical activity into everyday subjects, not just math. The observer will be able to compare her data with the data they collected in their literature review to compare if the research found was accurate.

The project will be taking place at a private elementary school in Santa Cruz. The reason the observer chose a private school over a public school is because they were more familiar on how the Physical Education program, as well as, the Mathematics program is being ran at a private school because of their own experience. The students are in the fourth grade.

Implementation

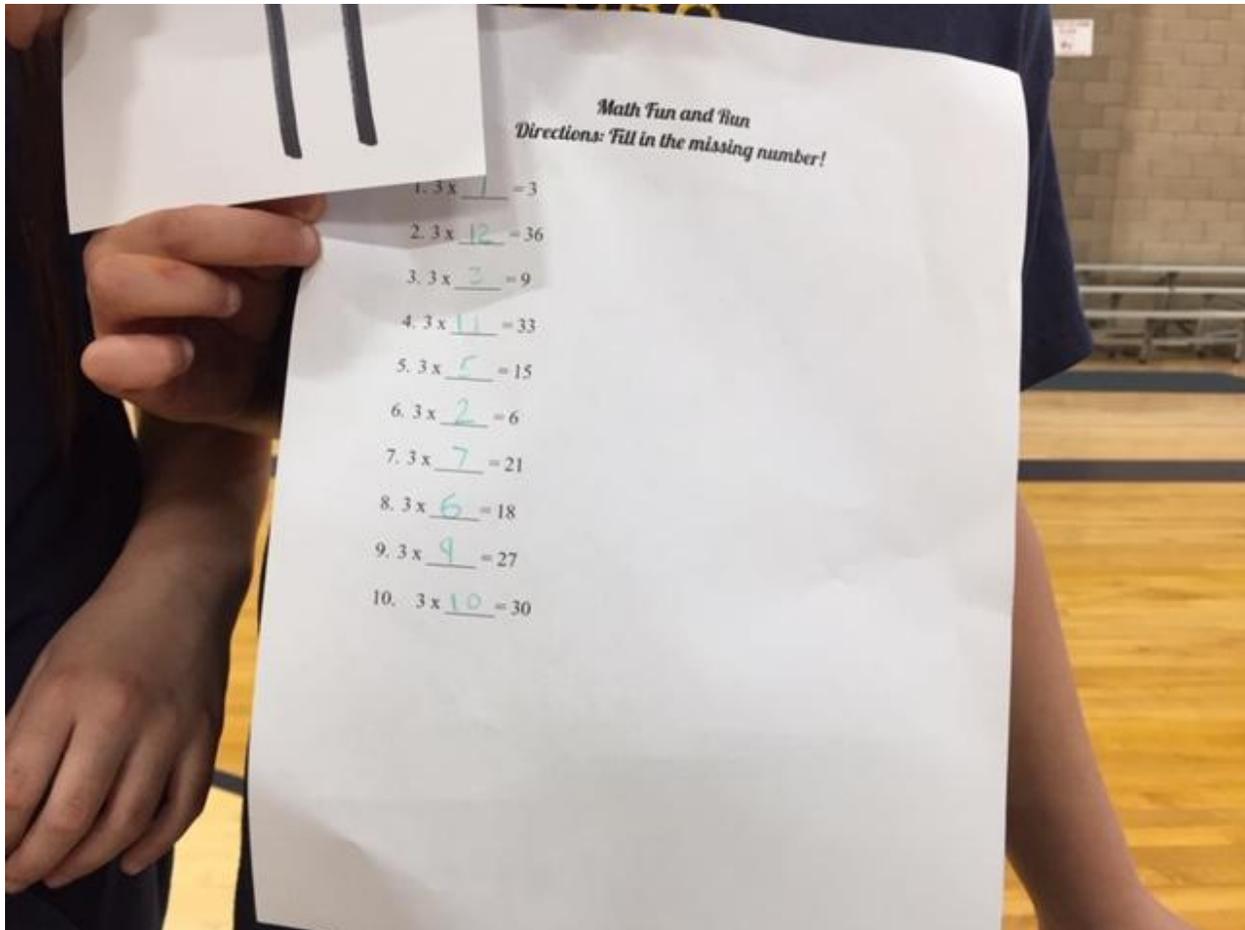
The observer visited the fourth grade during their physical activity class, where they were handed notecards with math expressions. The math was based off the level the students were learning during the two weeks the observer visited. The students were learning their single digit, multiplication facts. The students were split into two groups, one group with the expressions, the

other group had the answers. Week one, the partners were handed a worksheet to work together to review the multiplication facts they went over in the beginning of the class. Students, during the second week of the lesson they were asked to find their missing partner, but to do a worksheet individually. The reader is able to access the lesson plan in appendix A.



Azevedo, A. (2019). *Multiplication Cards*.

The multiplication card image above is an example of what the observer was teaching the students the first week of teaching. The students were learning their multiplication factors of three during the first week of observations. The students were given the notecards and were asked to find their missing math partner. The reader is able to access more examples of the the multiplication cards in Appendix B.



Azevedo, A. (2019). *Multiplication Worksheet*

The multiplication worksheet is from the first week of visiting. The worksheet was designed like the note cards that were given during the warm-up. The students worked together on the first week to review their multiplication factors of three. The observer gave the students the opportunity to work together to help challenge each other. This also allowed students to prepare for week two of working individually. The reader is able to reference more examples of the Multiplication worksheets in Appendix C.



Azevedo, A. (2019). *Multiplication Cards*.

The image above is an example of the students finding their missing partner during week two of observations. The students were in the process of learning their multiplication factors of fours. The first week the students were handed part of the expression and were asked to find the missing part of the expression. The second week students were given the whole expression and asked to find the answer to the mathematics expression. The reader is able to access more multiplication card examples in Appendix B.

Math Fun and Run
Directions: Fill in the blank!!

1. $4 \times 4 = \underline{16}$
2. $4 \times 12 = \underline{48}$
3. $4 \times 3 = \underline{12}$
4. $4 \times 7 = \underline{\cancel{28}}$
5. $4 \times 2 = \underline{8}$
6. $4 \times 10 = \underline{40}$
7. $4 \times 0 = \underline{\frac{0}{2}}$
8. $4 \times 8 = \underline{\cancel{32}}$
9. $4 \times 5 = \underline{\cancel{20}} \ 20$
10. $4 \times 11 = \underline{44}$

Extra:

11. $4 \times 6 = \underline{24}$
12. $4 \times 1 = \underline{4}$

The worksheet above was given on week two of observations. The students were asked to find their missing math partner during the warm-up. They were given this worksheet of their four factors after the warm-up, and were asked to work on it individually. The observer wanted the students to work individually on the worksheet in order to compare their performance from the first week with a partner and then their performance by themselves. The observer noticed the students had difficulty working alone on the worksheet, due to some errors on the worksheet. The reader can reference more examples of the Multiplication worksheet in Appendix C.

Evaluation

The students were engaged and were attentive throughout the two weeks the observer taught. The observer was able to obtain information that was needed to make connection to their literature research. The observer found that the students were more engaged when asked to work with partners to fill out the worksheet. They much rather work together than alone when being assessed on their multiplication. The observer noticed that the students were eager to get their assessment done after they did the find your “missing math” partner game. The students responded well to the instruction, as well as, benefitted from doing the warm-up before going straight into the assessment. The observer was pleased to realize how smart the students were in their multiplication facts, as well as, their eagerness to do math during their normal Physical Education class. The students, the first week were able to work with each other on the assessment; the observer found this way to teach students to be more beneficial to the students engagement and learning. The students, the second week were asked to work individually on the assessment; the observer found that students were still wanting to work together. The observer, however realized that the students performed equal on both weeks of the lesson, however found more errors on week two’s assessment than week one. The students met the learning objective at

the end of the two weeks, and were able to apply their multiplication skills. The observer may have a hard time implementing the project in a public school setting due to the difference in curriculum being taught at a public school versus a private school.

Reflection

This portion of the Capstone Paper discusses the literature review, the project, the limitations and the success of the project. It provides recommendations on how to improve on this Capstone topic. The writer discusses how the Capstone can be implemented into her future career. This portion concludes on the overall Capstone experience, and the topic chosen.

Discussion

The literature review discussed how physical activity was being reduced in public schools, especially in the elementary level. The articles being researched were looking into fourth-grade level. The articles discussed how physical activity in an elementary level was beneficial to students' academic performance, engagement, and cognitive growth. The authors provided examples for teachers to use in order to integrate physical activity into their everyday classroom. The project was based off information the literature review provided in order to implement physical activity into a specific subject. The project, for example used multiplication factors and was implemented into a physical activity format.

The project, overall was a success. The students were engaged in the lesson, and they were able to obtain their multiplication skills during their missing partner game, as well as, their assessments. The students met the learning objective that the observer made for the grading rubric presented in Appendix A. The students expressed that they enjoyed the project and that were looking forward to the observer to teach them again. The students were engaged, and had no problem helping each other during the assessment portion of the lesson. The observer found

that separating the students into two teams allowed the students to work with other classmates rather than directly going to their friends.

The limitations the researcher found during the project were location, time and assessments. The observer did the project in a private school, in a fourth-grade classroom. The observer had no problem implementing the lesson into a private school schedule; however they faced problem when the information provided in the literature review was based in a public school. The reason for this limitation is because the difference in curriculum between a private school and public school. The lesson being implemented in a private school may not work in a public school based off a students' mathematics level, or their physical education program. The lesson could be taught different in a public school due to time management of teachers in a classroom. This could be considered a limitation as well because the data found on how much a public school should provide physical activity could be different in the private school.

The second limitation the project provided was time. The observer was able to get through the lesson in two weeks, as needed, but struggled with the amount of time provided for the research. The reason being had to do with allowing the students enough time to walk to the gym, provide them with the multiplication cards, and lastly giving them the assessment. The observer was able to get through the whole lesson, however having a little more time would have provided more structure and allow more time for students to concentrate on their assessment. The assessments were a limitation because the students were asked to work individually on the worksheet during the second week, however some students helped their partner. This is considered a limitation because the observer may have a problem comparing the outcome from week one and two.

Recommendation

The observer suggest that if the reader wants to do the Capstone Project in the future, in order to prevent limitations the reader should do the project in a public school rather than a private school. This will provide the observer with information that is more beneficial to connect to the information provided in the literature review. The reader may want to state the outcome she wants from the students when visiting the classroom, for example making sure the students know ahead of time that they are working individually on the assessment provided on week two. This way the students are aware of the lesson being taught and to get the proper time in order to complete the assessment. The writer found that the article by Lindt and Miller (2017) was useful when completing the Capstone Project. It provided feedback and examples on how teachers are able to incorporate physical activity into an everyday lesson plan. The observer believes that if she were to do the project and Capstone Paper over again she would focus on the third-grade level. The students in the fourth-grade were able to complete the task quickly. The observer found the project to be more of a review for the fourth-grade, where she thinks the third grade level would benefit from the lesson better.

Future Plans to Build on Capstone

The observer is able to build on the Capstone in the future by implementing physical activity into their classroom. The observer has taken the research given into consideration and was able to find possible ways on how to integrate physical activity into their daily classroom schedule. An idea for the observer to integrate physical activity into her classroom is by using the lesson plan created as a fun way to teach students mathematics. The observer could take the grade level they are teaching and use the type of math they are learning at the time. The observer can also incorporate physical activity into other subjects such as, Spelling, Reading and Science. If the observer, however has a hard time incorporating physical activity into a subject being

taught but still wants to use physical activity in their classroom; they are able to allow the students breaks.

Conclusion

The Capstone topic was chosen to focus on the importance of Physical Education in the elementary level. The paper touched on how students, who participate in physical activity perform better on classroom assignments and stay more engaged in the lesson being taught. It also discussed how public schools were not participating in physical activity due budget cuts and lack of knowledge on how beneficial it is for students. The paper, lastly provided feedback on how teachers are able to incorporate physical activity in their daily teaching.

The observer found that the Capstone Project challenging with working at the fourth-grade level, however found it to be rewarding when she witnessed the students being engaged in the lesson. The observer found that teaching the lesson provided information that physical activity does in fact benefit students way of learning. It also allows them to be more engaged in a lesson being taught. The writer providing the information on how to incorporate physical activity in their classroom, and showing the lesson they taught provided insight on how future teachers can use physical activity in their classroom routine.

References

- Benjamin, R. (2013). The importance of 60 minutes or more of daily physical activity. *Public Health Reports (1974-), 128(5)*, 350-351. Retrieved from <http://www.jstor.org/stable/23646552>
- Brusseau, T. A., & Hannon, J. C. (2015). Impacting children's health and academic performance through comprehensive school physical activity programming. *International Electronic Journal of Elementary Education, 7(3)*, 441-450. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1068063.pdf>.
- Conyers, M., & Wilson, D. (2015). Smart moves: Powering up the brain with physical activity. *The Phi Delta Kappan, 96(8)*, 38-42. Retrieved from <http://www.jstor.org/stable/24375885>
- Lindt, S., & Miller, S. (2017). Movement and learning in elementary school. *The Phi Delta Kappan, 98(7)*, 34-37. Retrieved from <http://www.jstor.org/stable/26386933>
- Lorenz, K. A., Stylianou, M., Moore, S., & Kulinna, P. H. (2017). Does fitness make the grade? The relationship between elementary students' physical fitness and academic grades. *Health Education Journal, 76(3)*, 302–312. doi: <https://doi.org/10.1177/0017896916672898>
- Ratey, John J., Hagerman, Eric. (2008) *Spark: the revolutionary new science of exercise and the brain* New York : Little, Brown. Retrieved from: https://books.google.com/books?id=zM_9Ft1j40UC&printsec=frontcover&dq=spark+john+ratey&hl=en&sa=X&ved=0ahUKEwj_2unA77HgAhUOCTQIHbetBZUQ6AEIKDAA#v=onepage&q=spark%20john%20ratey&f=false

Sacheck, J., Wright, C., Chomitz, V., Chui, K., Economos, C., Schultz, N., Tufts University.

(2015). *Active bodies, active minds: A case study on physical activity and academic success in Lawrence, Massachusetts. understanding Boston. Boston Foundation. Boston Foundation.* Retrieved from

<http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED559374&site=ehost-live>

Snyder, K., Dinkel, D., Schaffer, C., Hiveley, S., & Colpitts, A. (2017). Purposeful movement:

The integration of physical activity into a mathematics unit. *International Journal of Research in Education and Science (IJRES)*, 3(1), 75-87. Retrieved from:

<https://files.eric.ed.gov/fulltext/EJ1126688.pdf>

Trost, S. G. (2007). Active education: Physical education, physical activity and academic performance. Retrieved from

https://folio.iupui.edu/bitstream/handle/10244/587/Active_Ed.pdf?sequence=2

Wade, M. (2016). Math and movement: Practical ways to incorporate math Into physical education, strategies. *A Journal for Physical and Sport Educators*, 29(1), 10-15.

doi:<https://doi.org/10.1080/08924562.2015.1111788>

APPENDICES

APPENDIX A: LESSON PLAN

APPENDIX B: MULTIPLICATION CARDS

APPENDIX C: MULTIPLICATION WORKSHEETS

APPENDIX A: LESSON PLAN

Math Fun and Run

Lesson Overview

1. Subject: Physical Activity and Math
2. Topic: Using math in a Physical education environment.
3. Grade Level: Fourth-grade
4. Measurable Learning Objective: Students will apply their multiplication skills to help identify their missing math partner.
5. Summary of Lesson: Students will be provided notecards that will have a multiplication problem. The cards will have a blank spot square in the problem. This will allow the students to run around and find their missing math partner, or the answer to the multiplication problem. The students will be tested twice with these skills to see if their mathematics skills have improved. At the end of each lesson the students will be tested in these skills.

Implementation

The students of the fourth-grade level are currently learning their single digit, multiplication factors. In their Physical Education program the students are learning basic physical activity such as running laps for warm-ups, and playing an instructional game. The lesson being taught will be a combo of the two subjects together, that allows the students to use their skills from Physical Education and apply them to their Mathematics skills. The teaching strategy being used during this lesson will be modeling. The teacher will demonstrate how the lesson should be done. After, the students will be asked to work together in order to find their “missing pair”. The lesson will end with the students receiving a worksheet with the multiplication concepts used during the math fun and run activity. The teacher will provide a

similar lesson the second time they visit the classroom. The second lesson will use the same multiplication concepts, however they will be written differently to see how much the students were able to comprehend the concepts from before by seeing them in a different way. They will again receive a worksheet at the end of the period to review the concepts taught throughout the activity. The lesson being taught will take two class periods.

Procedure

The teacher will introduce the lesson to the students by getting the students to warm-up in beginning. This will allow the students to get engaged and focused. The teacher will then ask the students to stand up and spread out, while they are handed a card. The teacher will demonstrate the lesson by asking the teacher they are working with to hold a card with the correct answer. After the demonstration of the teachers, the students will be asked to do a run through with the assistance of the teacher. As for the independence practice, this is where all the students will perform the lesson on their own by using their classmates for assistance. The teacher will be watching over them as they perform the activity to make sure they understand the concept of the lesson.

Materials and Resources

Materials needed:

- Flashcards
- Pencils

Resources Needed:

- Worksheet

Standards and Assessments

Use the four operations with whole numbers to solve problems.

[CCSS.Math.Content.4.OA.A.1](#)

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.

Students demonstrate knowledge of physical fitness concepts, principles, and strategies to improve health and performance.

Fitness Concepts 4.1

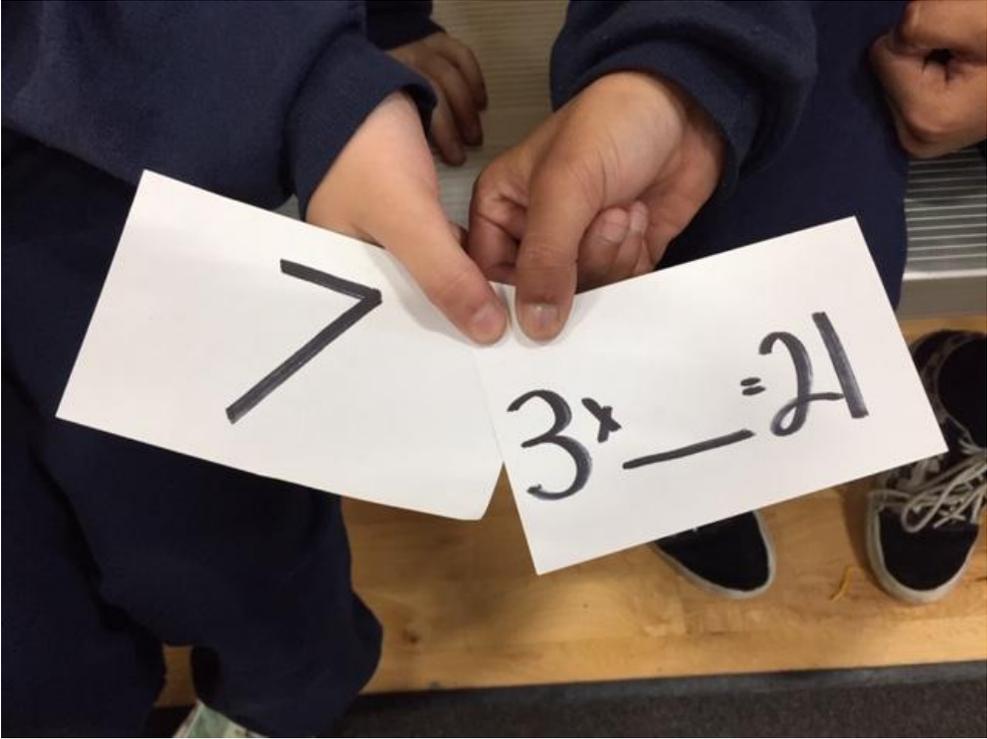
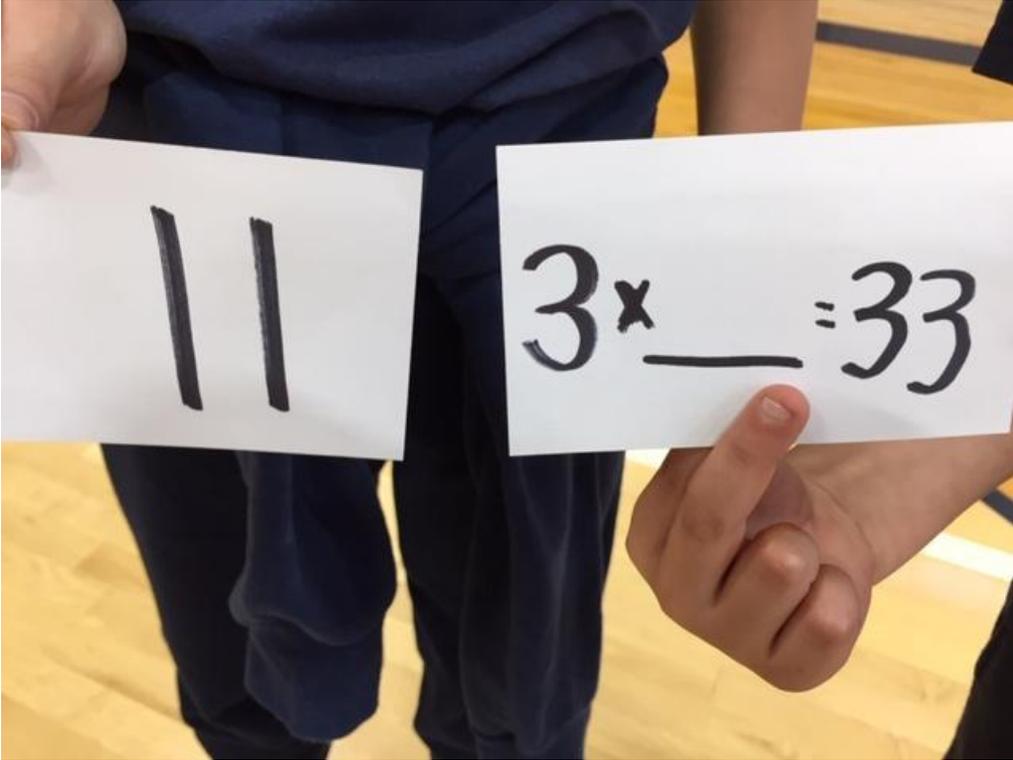
Identify enjoyable and challenging physical activities that one can do for increasing periods of time without stopping.

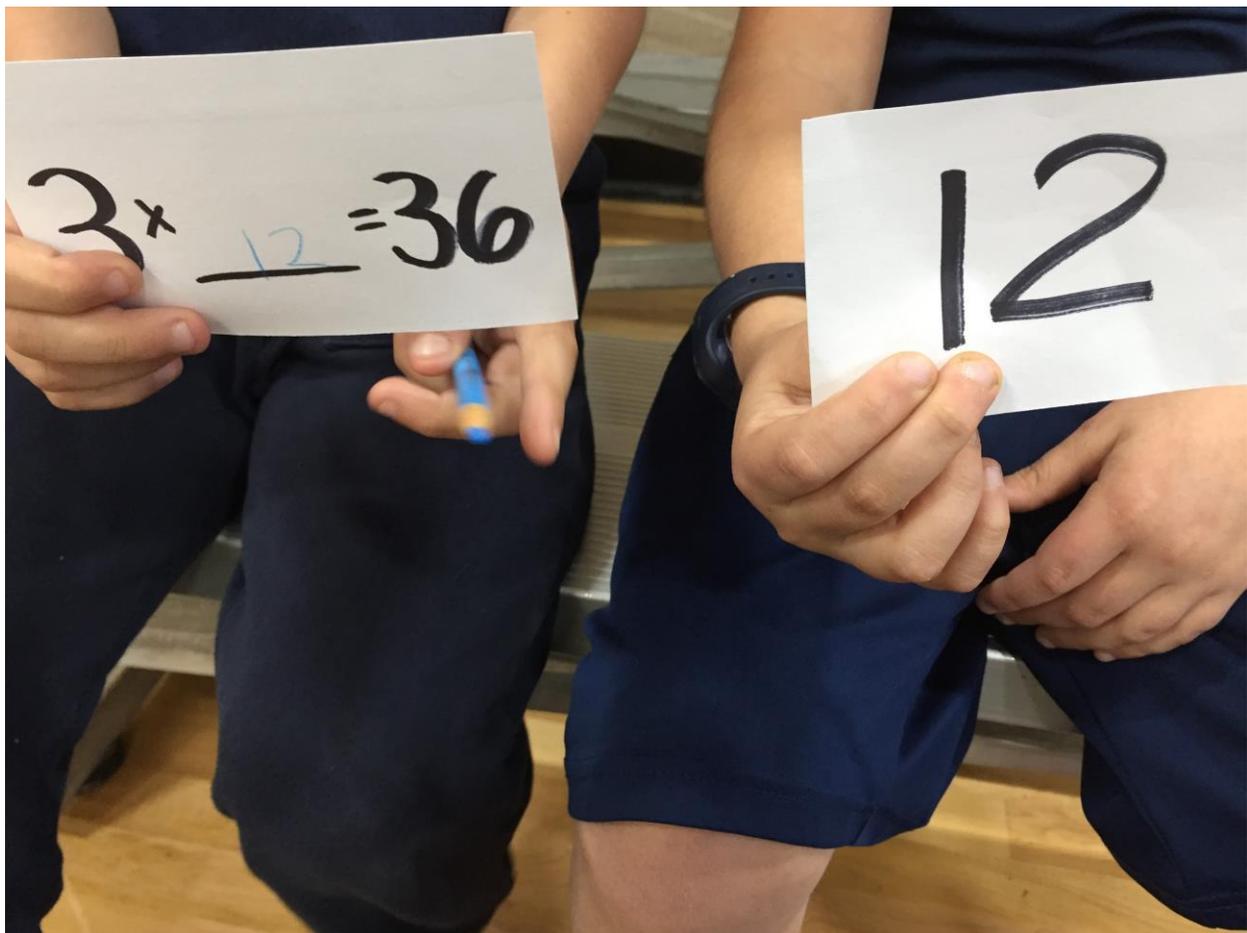
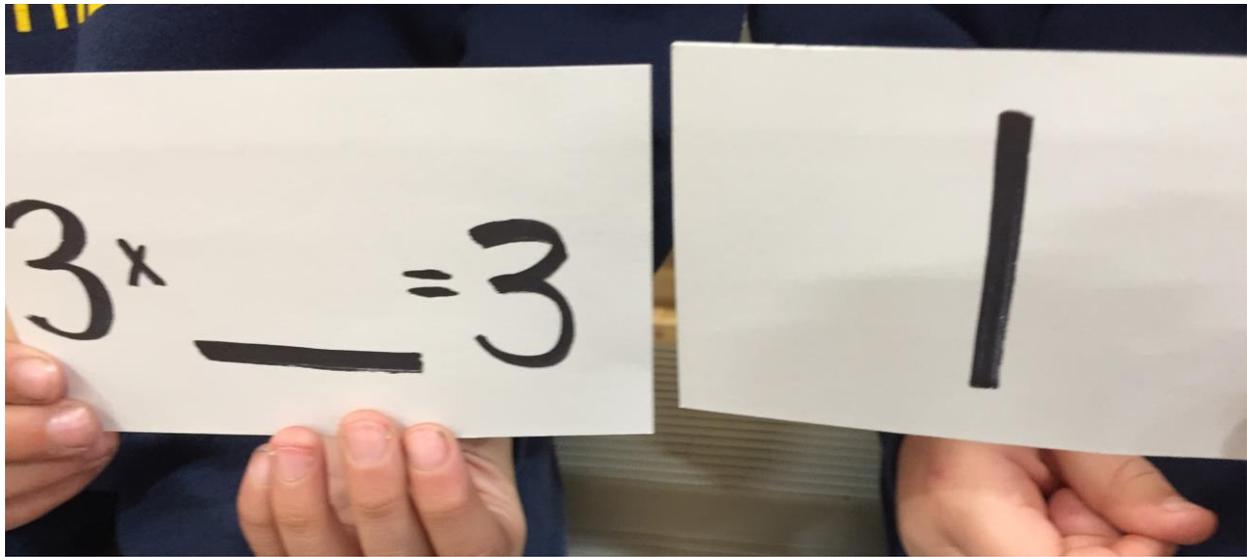
For the assessment part of the lesson, the students will be asked to read off their cards with their partner to determine if they found the right match. After they are done reading the cards together, the students will be given a worksheet with the multiplication factors they practiced to determine if moving around helped them comprehend the material as well as kept them engaged throughout the lesson. This worksheet will be given to the student and their “missing pair” partner for the first day of the lesson. The second day of the lesson the students will be given the flashcards again to find their “missing pair” partner. The students will then be given a similar worksheet, however it will be done individually.

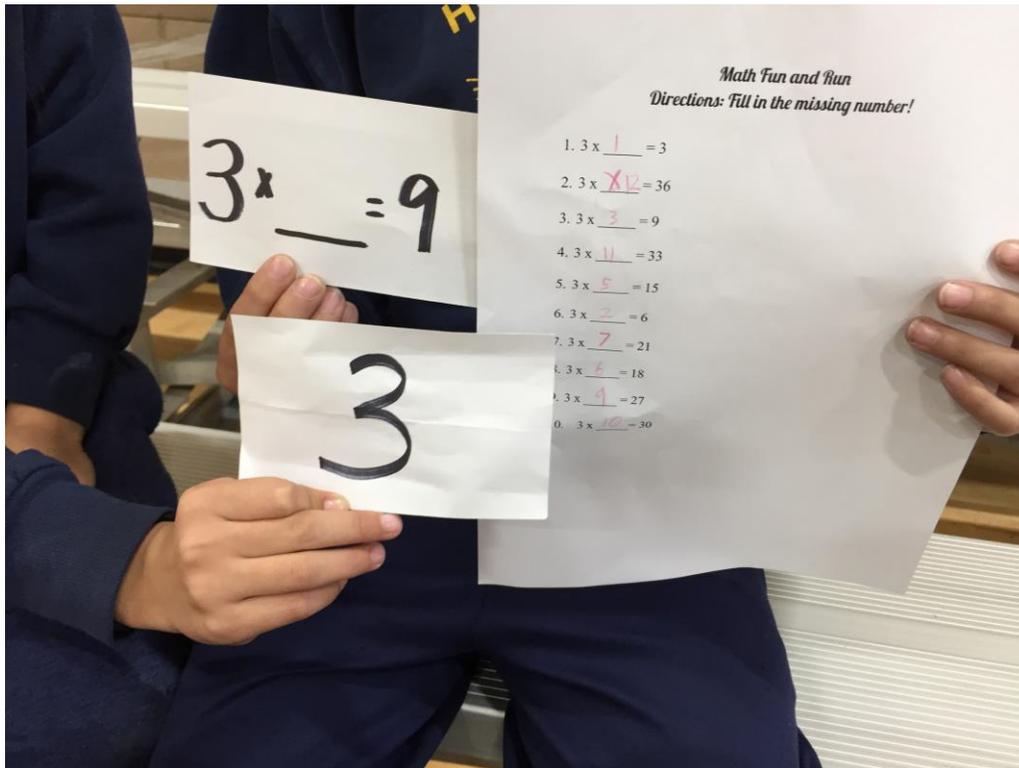
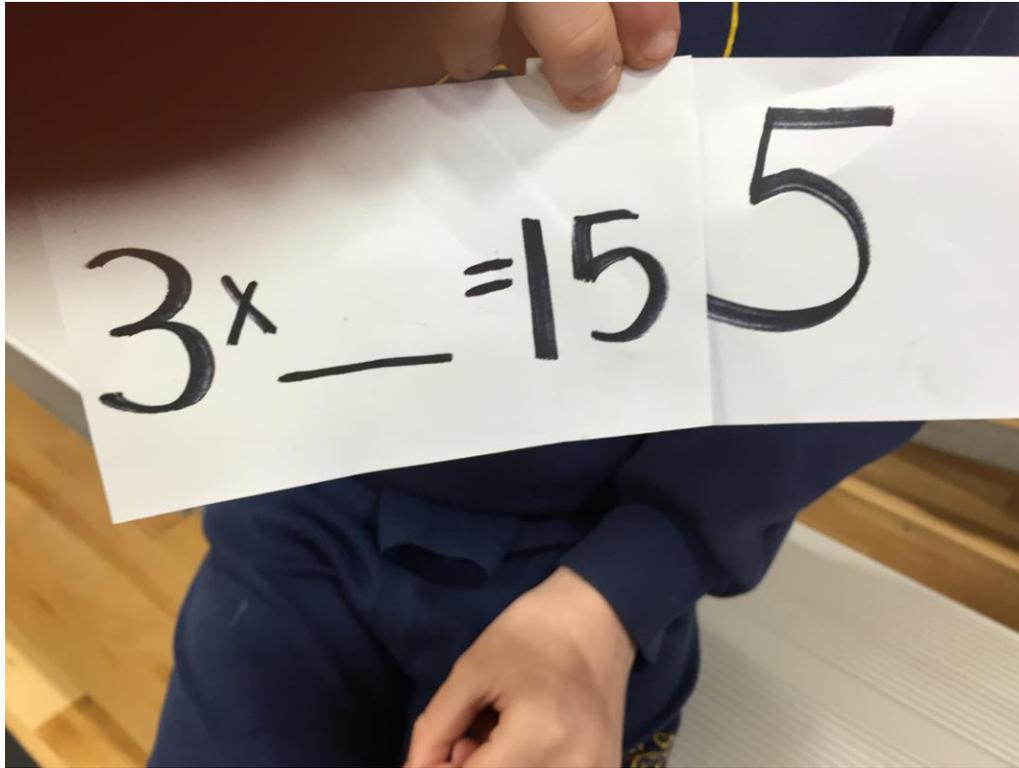
Grading Rubric

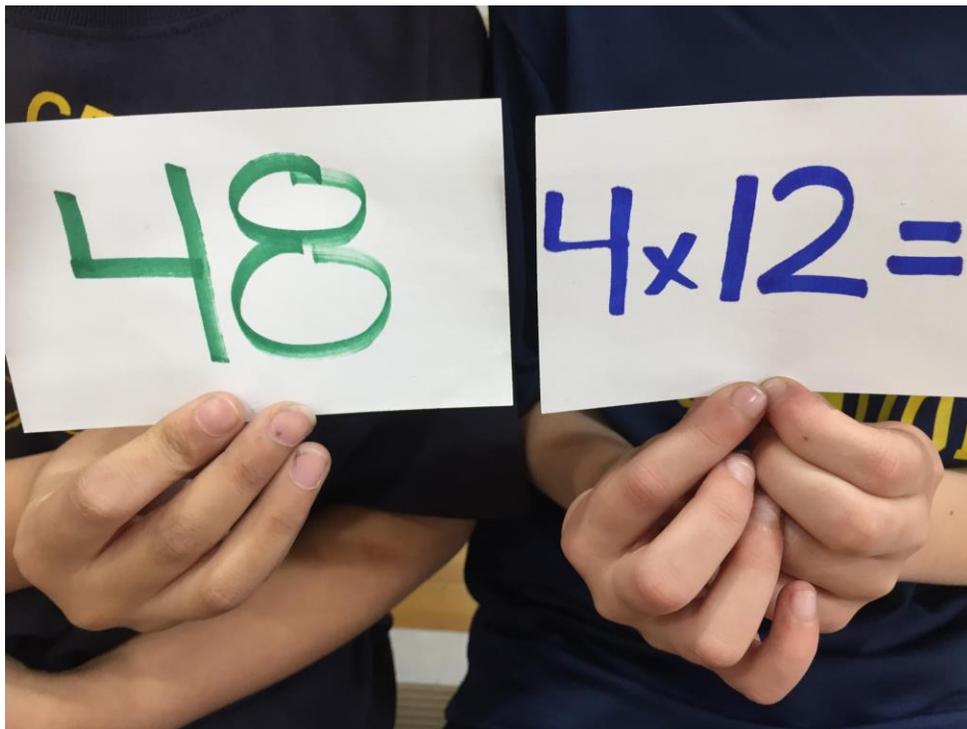
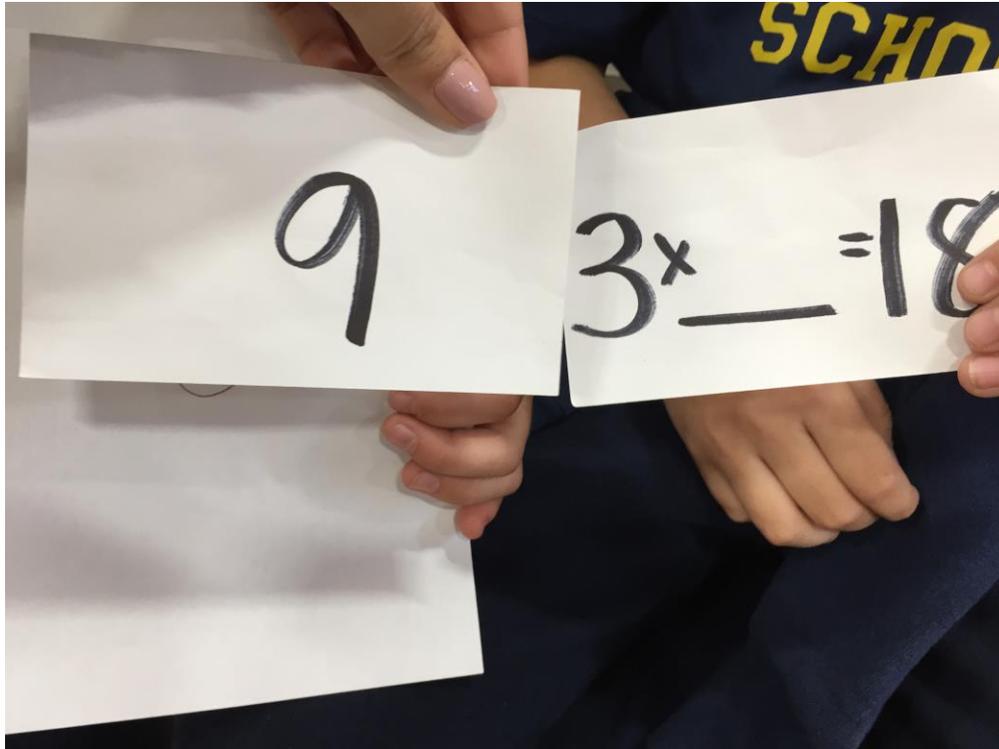
Category	4	3	2	1
Accuracy	The student was able to answer the math questions correctly on the the flashcards and worksheet.	The student was able to get part of the flash card and most of the worksheet correct.	The student had a hard time completely the flash cards and the worksheet.	The student did not complete the flash cards or the worksheet.
Engagement	The student was active throughout the lesson.	The student was partly engaged throughout the lesson.	The student had a hard time staying engaged throughout the lesson.	The student was not engaged throughout the lesson.
Collaborative	The student worked with others to find the answer.	The student partly worked with others to find the answer.	The student had a hard time working with others to find the answer.	The student did not work with others to find the answer.
Completion	The student completed all assignments neatly.	The student partially completed the assignments neatly.	The student had a hard time completely the assignments neatly.	The student did not complete the assignments neatly or at all.

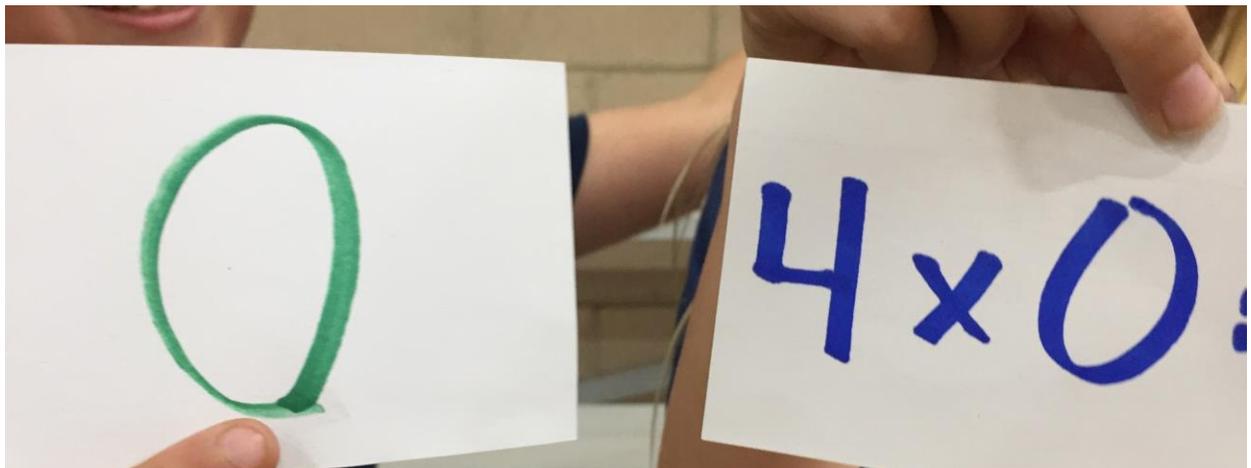
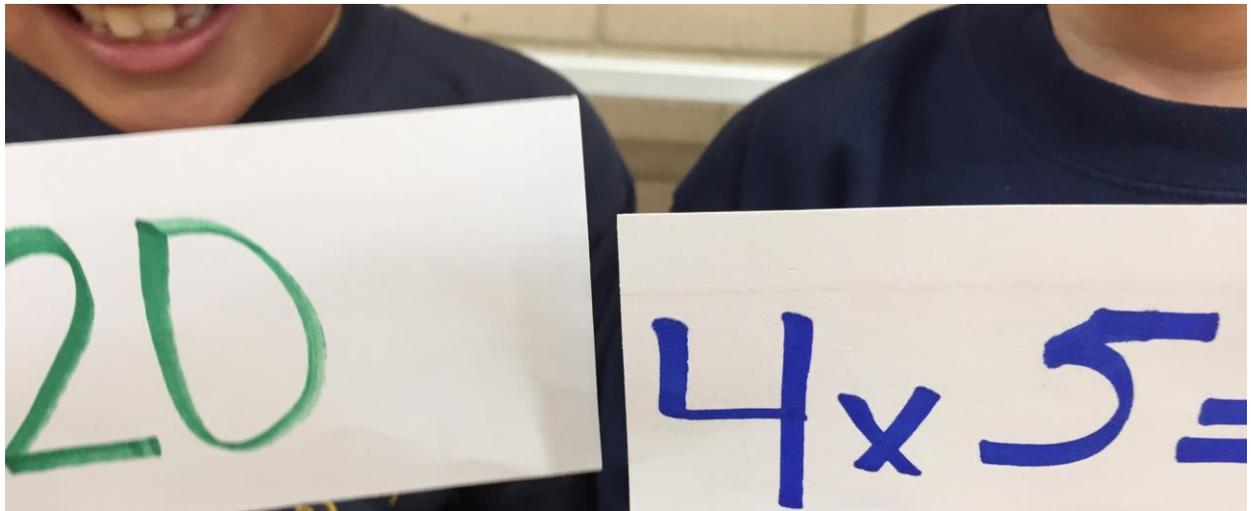
APPENDIX B: MULTIPLICATION CARDS

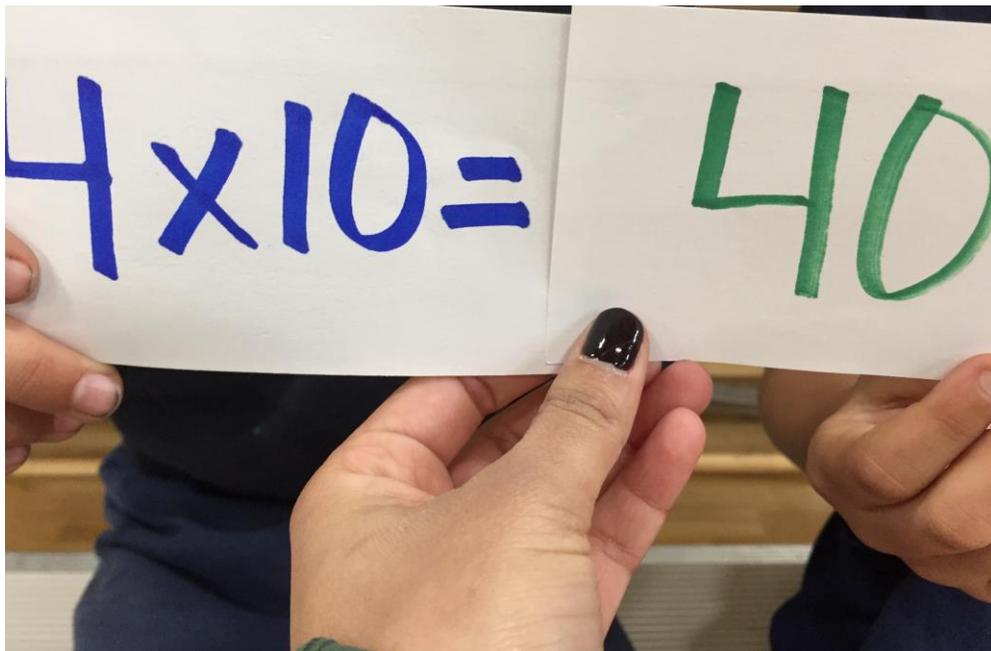
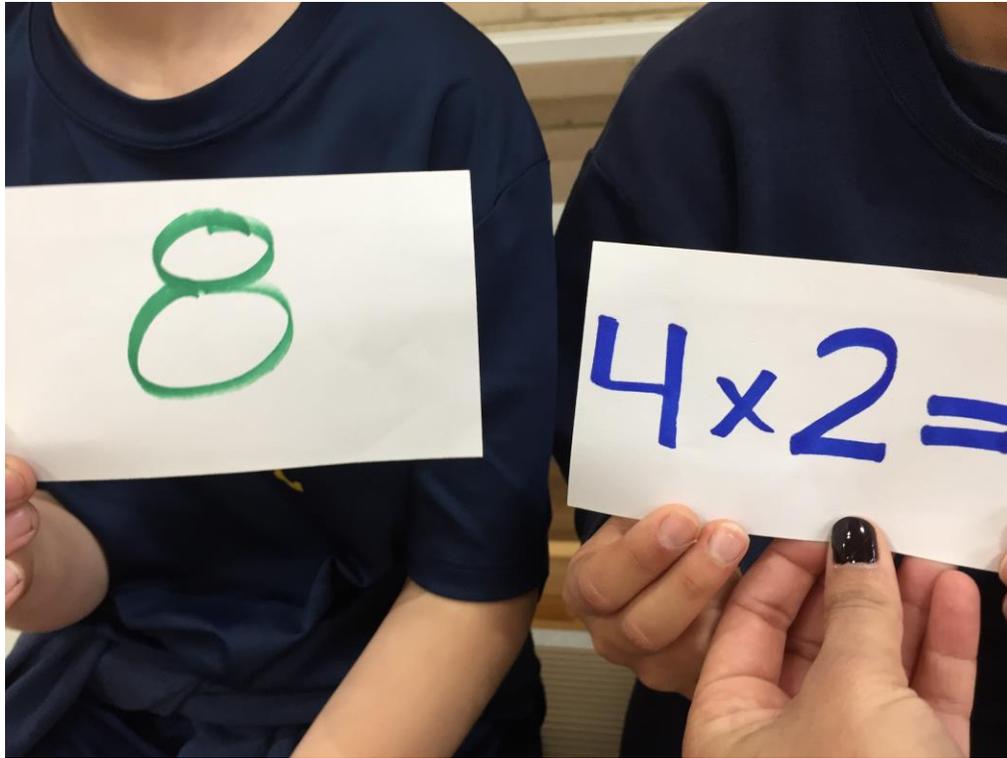


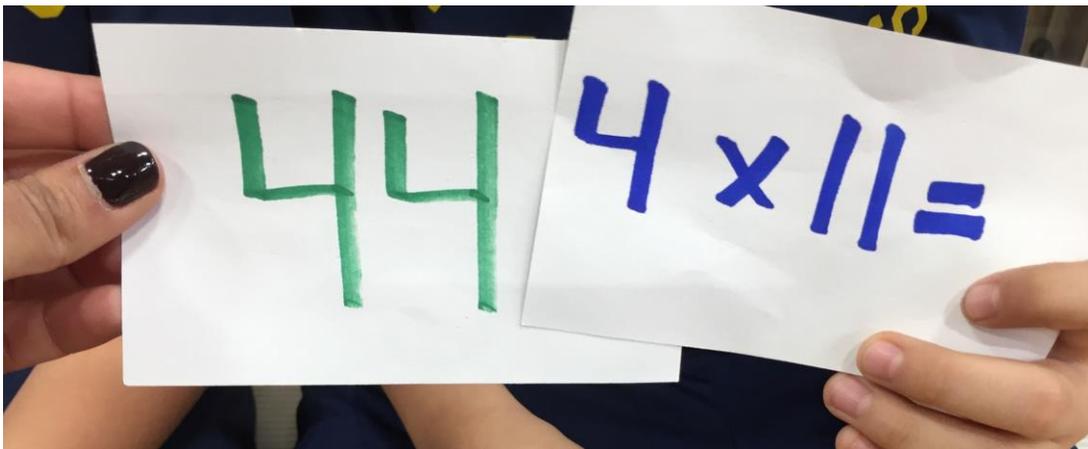
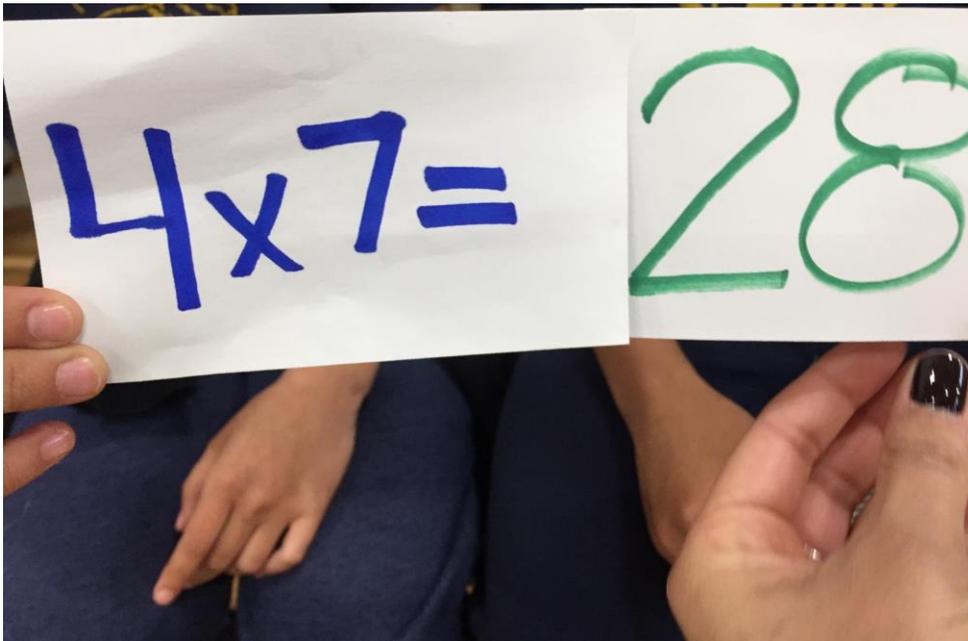
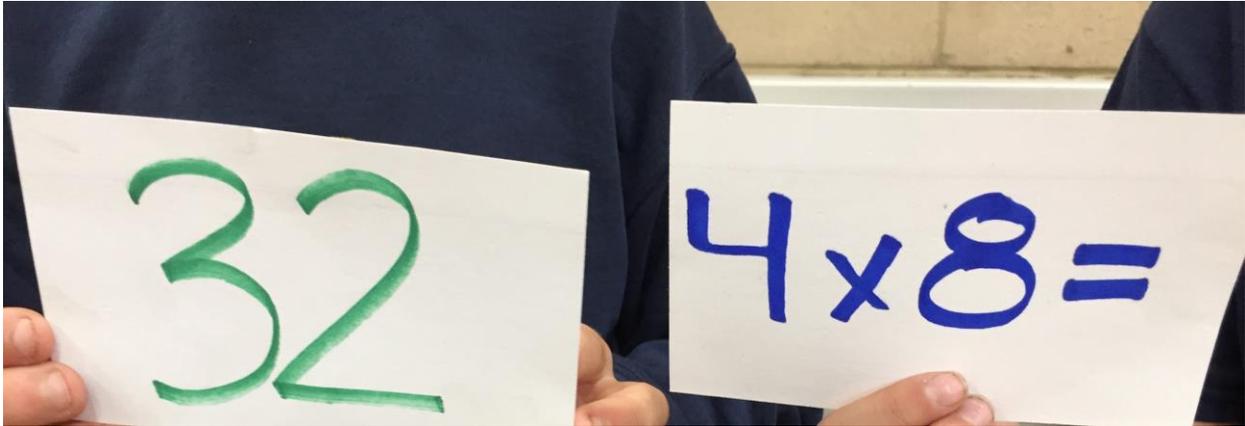




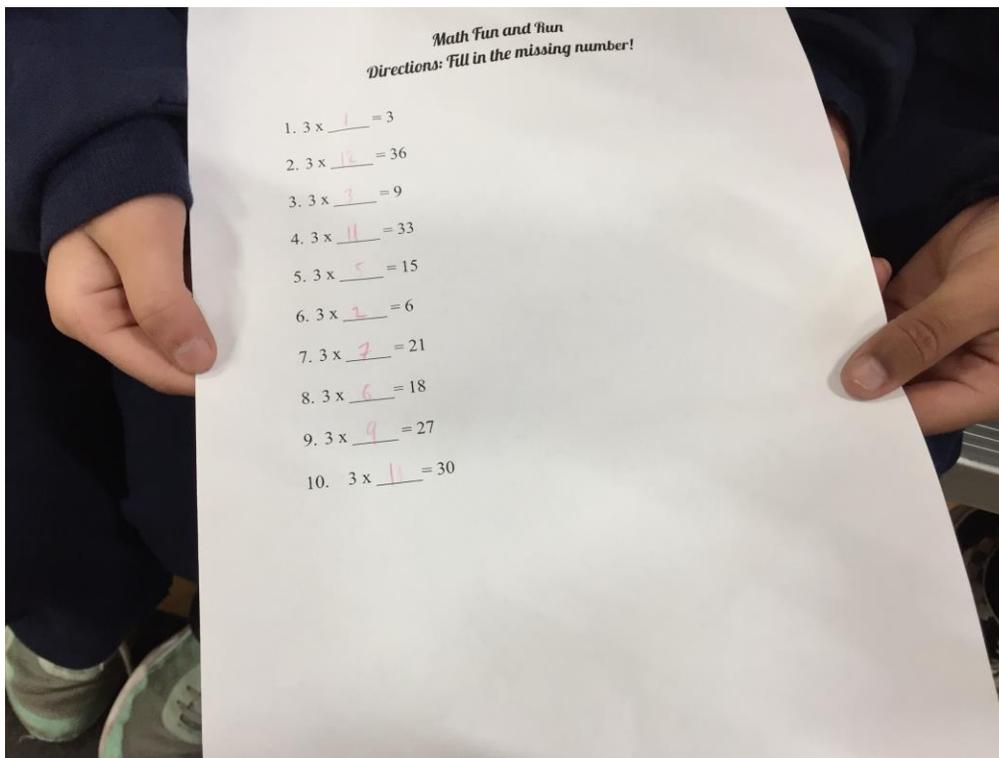
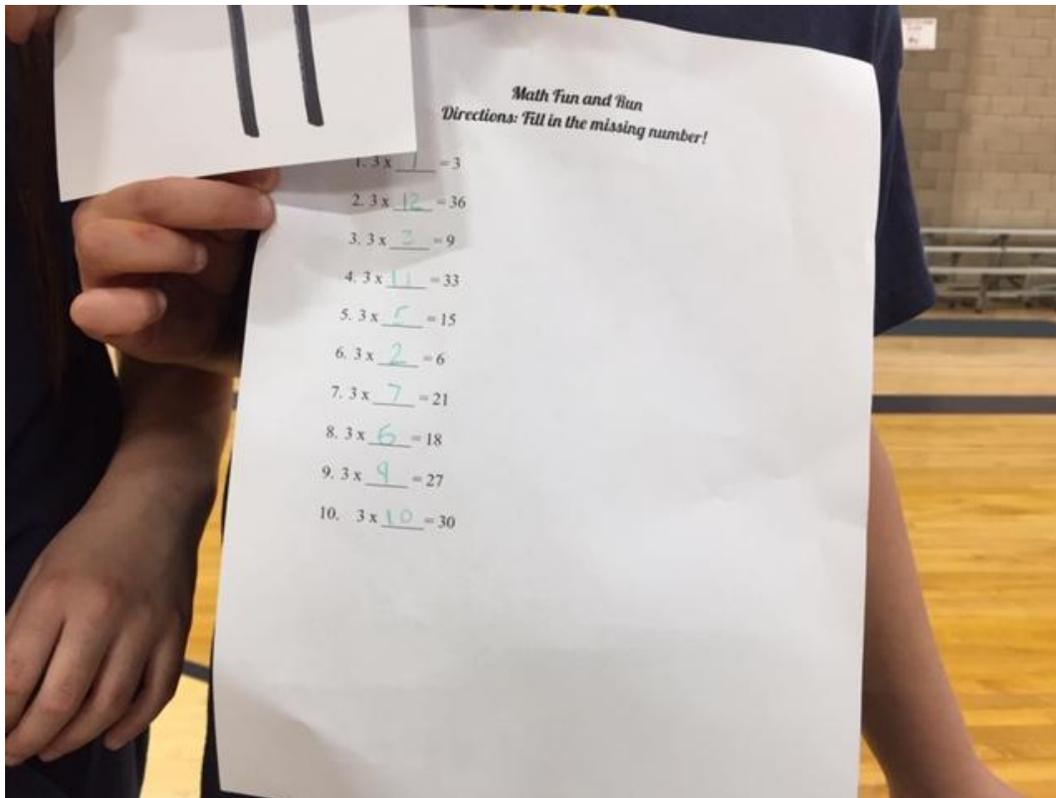


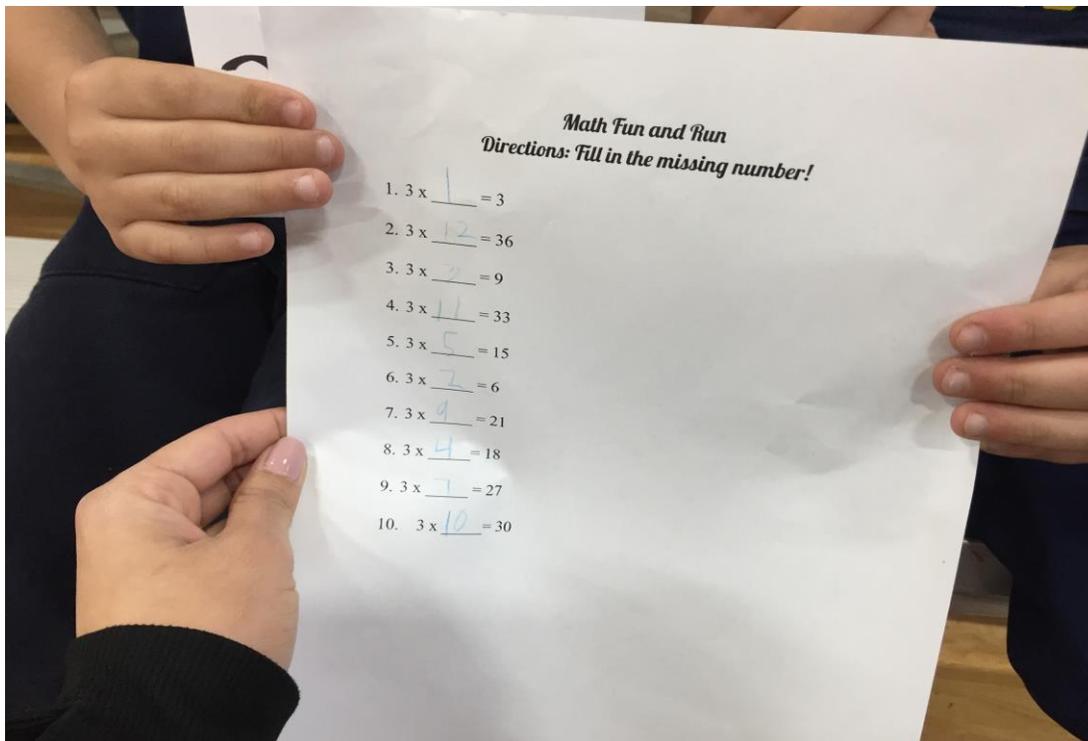
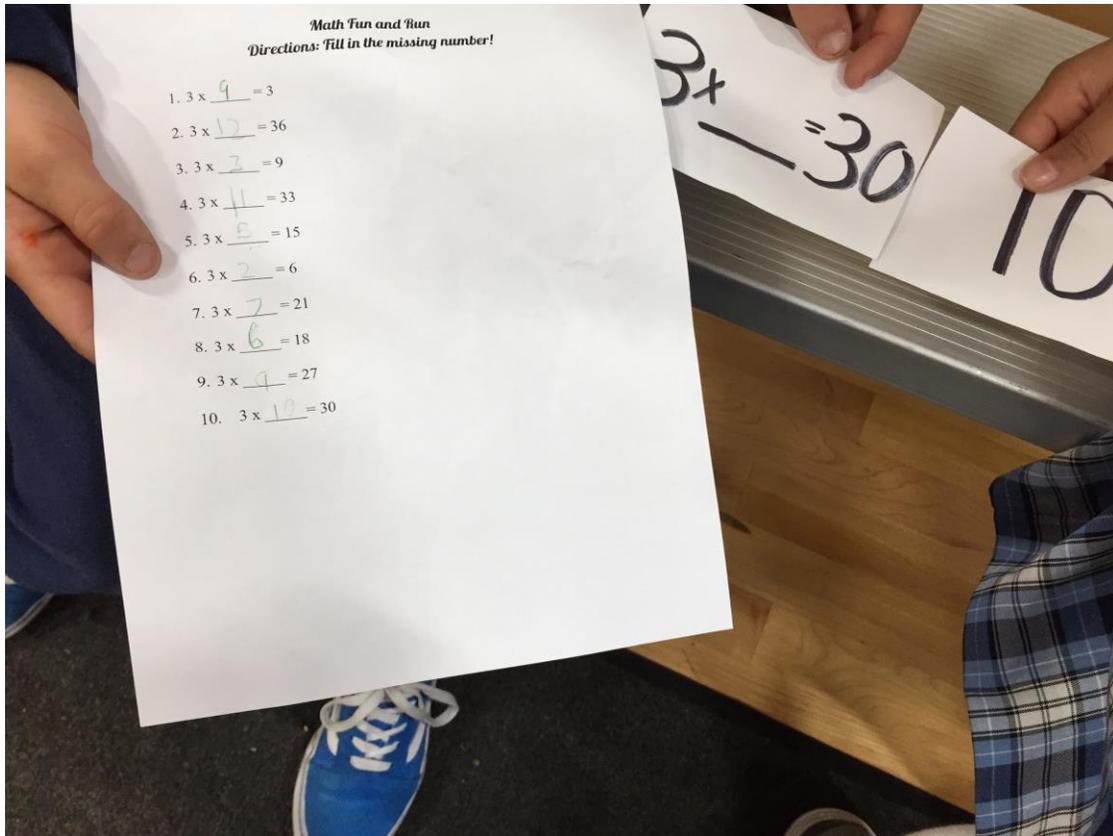


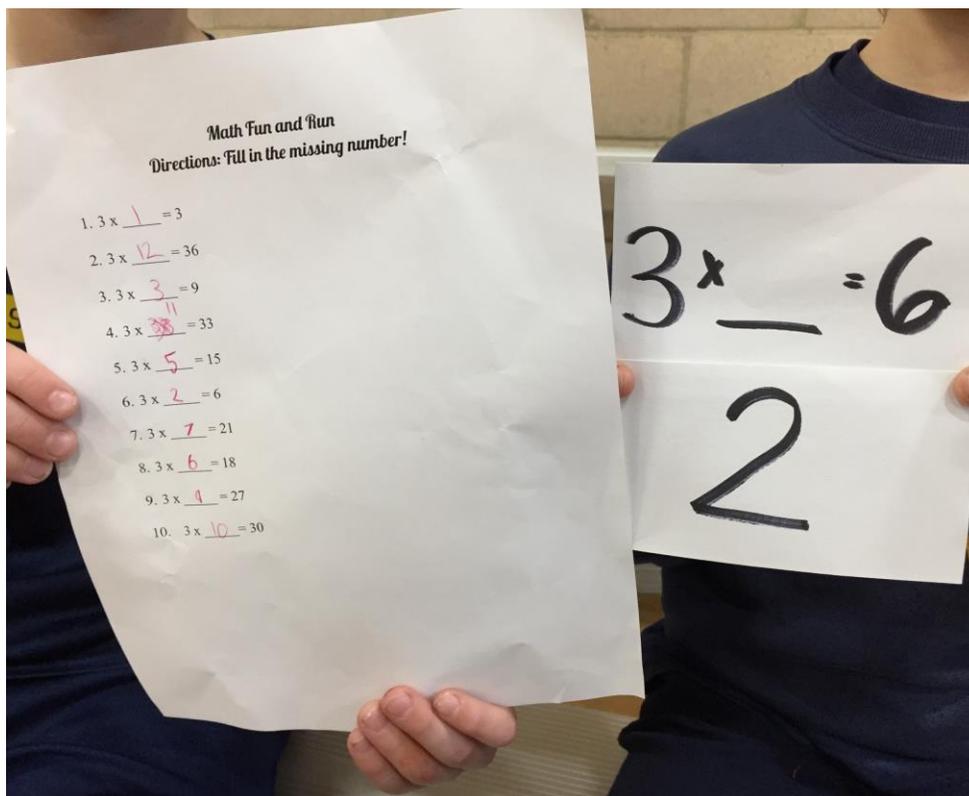
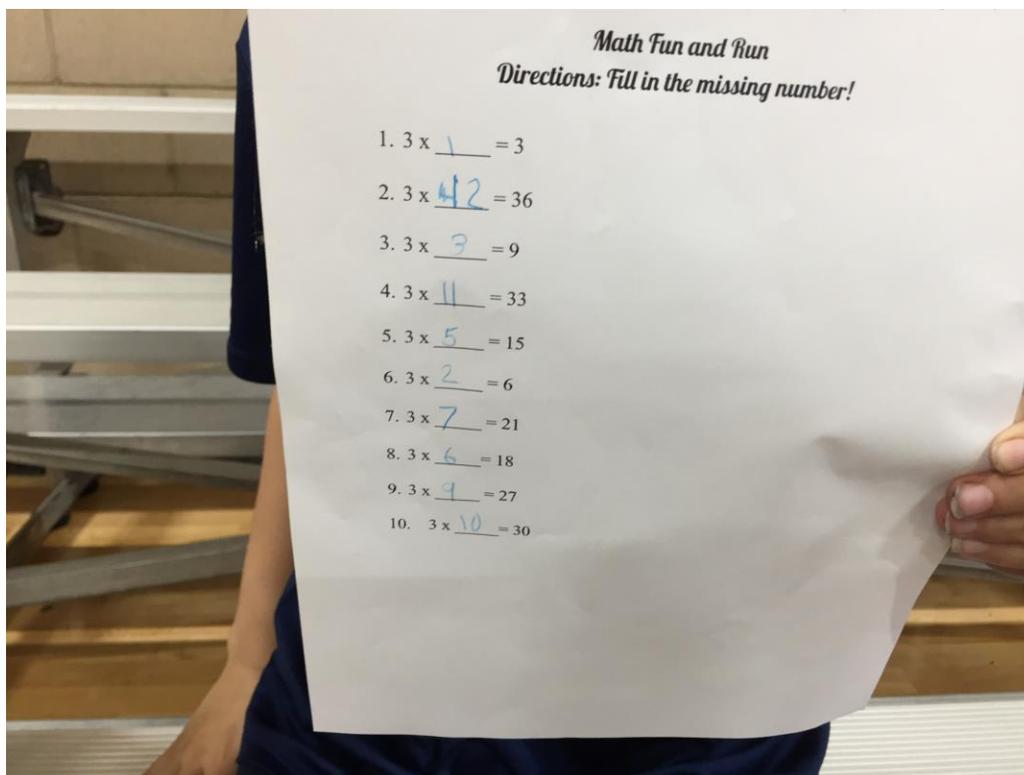


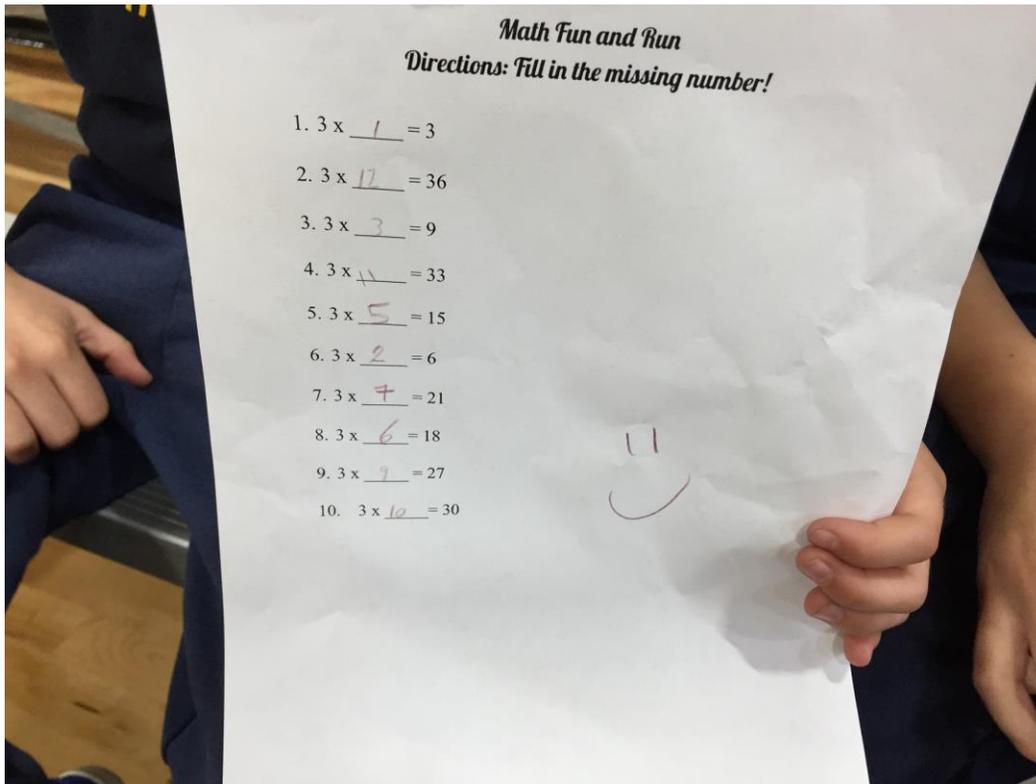


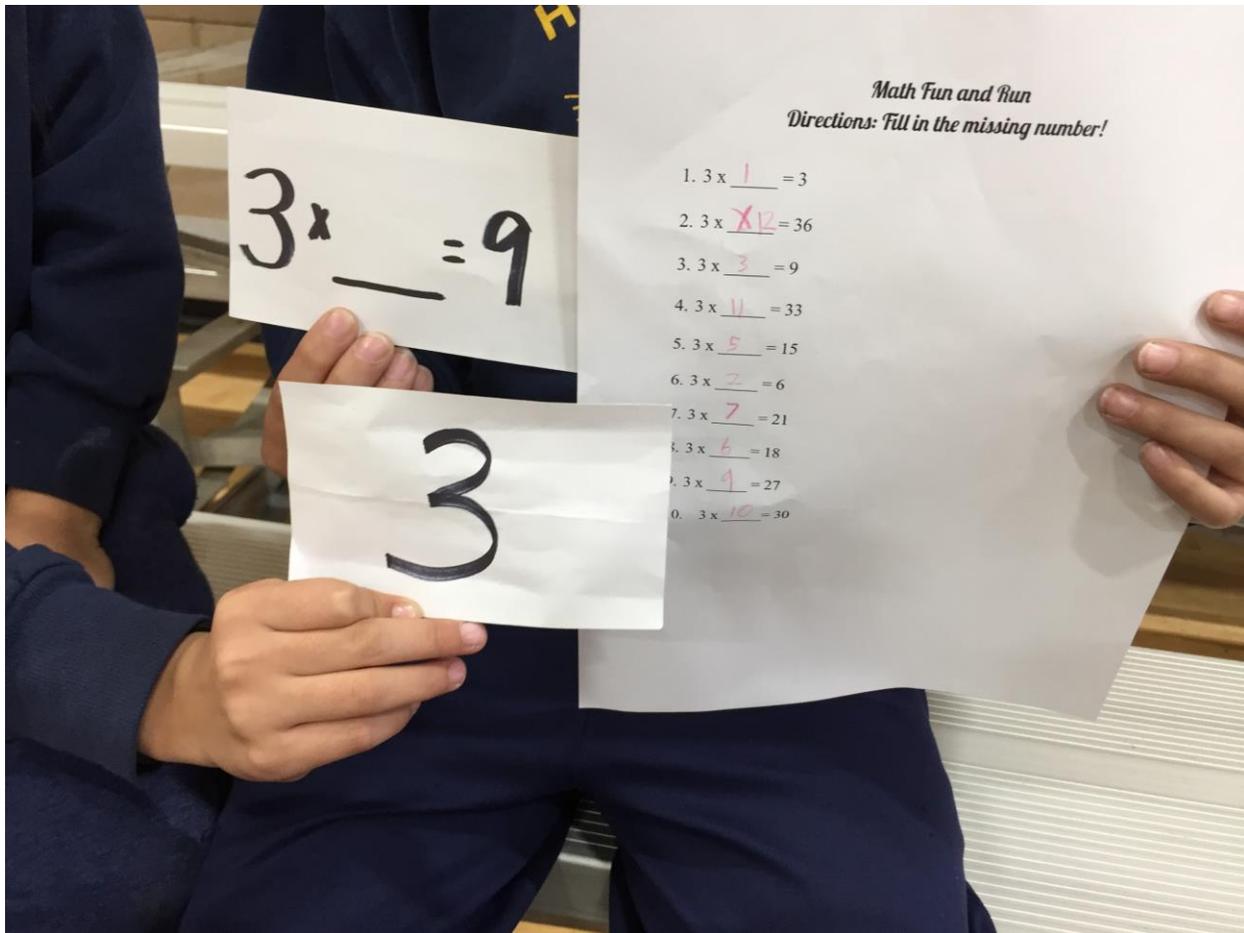
APPENDIX C: MULTIPLICATION WORKSHEETS











Math Fun and Run**Directions: Fill in the blank!!**

1. $4 \times 4 = \underline{16}$

2. $4 \times 12 = \underline{48}$

3. $4 \times 3 = \underline{12}$

4. $4 \times 7 = \underline{\cancel{28}}$

5. $4 \times 2 = \underline{8}$

6. $4 \times 10 = \underline{40}$

7. $4 \times 0 = \underline{0}$

8. $4 \times 8 = \underline{\cancel{34}}$

9. $4 \times 5 = \underline{\cancel{30} 20}$

10. $4 \times 11 = \underline{44}$

Extra:

11. $4 \times 6 = \underline{24}$

12. $4 \times 1 = \underline{4}$

Math Fun and Run**Directions: Fill in the blank!!**

1. $4 \times 4 = \underline{16}$

2. $4 \times 12 = \underline{48}$

3. $4 \times 3 = \underline{12}$

4. $4 \times 7 = \underline{28}$

5. $4 \times 2 = \underline{8}$

6. $4 \times 10 = \underline{40}$

7. $4 \times 0 = \underline{0}$

8. $4 \times 8 = \underline{32}$

9. $4 \times 5 = \underline{20}$

10. $4 \times 11 = \underline{44}$

Extra:

11. $4 \times 6 = \underline{24}$

12. $4 \times 1 = \underline{4}$

Math Fun and Run**Directions: Fill in the blank!!**

1. $4 \times 4 = \underline{16}$

2. $4 \times 12 = \underline{48}$

3. $4 \times 3 = \underline{12}$

4. $4 \times 7 = \underline{28}$

5. $4 \times 2 = \underline{8}$

6. $4 \times 10 = \underline{40}$

7. $4 \times 0 = \underline{0}$

8. $4 \times 8 = \underline{32}$

9. $4 \times 5 = \underline{20}$

10. $4 \times 11 = \underline{44}$

Extra:

11. $4 \times 6 = \underline{24}$

12. $4 \times 1 = \underline{4}$

Math Fun and Run**Directions: Fill in the blank!!**

1. $4 \times 4 = \underline{16}$

2. $4 \times 12 = \underline{48}$

3. $4 \times 3 = \underline{28}$ 12

4. $4 \times 7 = \underline{8}$ 28

5. $4 \times 2 = \underline{8}$

6. $4 \times 10 = \underline{40}$

7. $4 \times 0 = \underline{0}$

8. $4 \times 8 = \underline{36}$

9. $4 \times 5 = \underline{20}$

10. $4 \times 11 = \underline{44}$

Extra:

11. $4 \times 6 = \underline{24}$

12. $4 \times 1 = \underline{4}$