# Effectiveness of Peer Tutoring in Enhancing Fundamental Arithmetic Operations

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**Abstract**

This study utilized the descriptive correlational design to determine the effectiveness of Peer tutoring in enhancing Fundamental Arithmetic Operations of the fifty-two (52) learners in Grade III-Lily and Jasmine of U-og Elementary School, Inabanga, Bohol. Most of the respondents were at the age of 9 and majority were female. A researchers-made survey questionnaire was used as tool in gathering the data. The gathered data were tallied and analyzed using frequency count, simple percentage, weighted mean, and Pearson Product Moment Correlation Coefficient to test the relationship between Peer tutoring and Fundamental Arithmetic Operations. Results showed that the computed r-value 0.413782 was higher than the critical r-value 0.2732 at 0.05 level of significance with 50 degrees of freedom, so the null hypothesis was rejected. Therefore, there was a significant relationship between Peer tutoring and Fundamental Arithmetic Operations which implied that peer tutoring is one of the strategies that may help and assist learners in enhancing fundamental arithmetic operations.

**Keywords:** Peer Tutoring, Mathematical Operations, Motivation, Self-Confidence, Readiness, Addition, Subtraction, Multiplication, and Division

## 1. Introduction

Teachers have always been concerned with their teaching strategies to improve their students' performance, particularly in mathematics, since it is perceived to be difficult and boring (Fritz et al., 2019). To respond to this, various educational strategies have been employed to make learning mathematics more fun. One of the effective strategies is peer tutoring, an instructional method wherein the better-performing students are paired with the lower-performing ones. It is a flexible and peer-mediated approach where the students act as both tutors and tutees for collaborative learning.

This is particularly crucial in the Philippines, where studies have been consistent in indicating poor or unsatisfactory performance in mathematics among students. In fact, the mean performance of Filipino students in Mathematics is 1.17% below the standard average (Capuno et al., 2019; Pentang et al., 2020; Azucena et al., 2022; Aguhayon, 2023). It has also been reiterated in the National Achievement Test that the mean percentage score in mathematics falls below the standards set (DepEd, 2019, as cited by Aguhayon, 2023). Due to this fact, teachers must employ effective strategies, such as peer tutoring, in the classroom to support and promote mathematics education to achieve the common objectives of acquiring knowledge.

The Zone of Proximal Development (ZPD), developed by Vygotsky in 1978, provides a theoretical framework that supports the effectiveness of peer tutoring on enhancing fundamental arithmetic

operations. According to the ZPD, learning is most effective when it occurs in the space between what a learner can do independently and what they can achieve with guidance from a more knowledgeable individual (Mcleod, 2024). In the context of peer tutoring, high-achieving students can function as "more capable peers," offering support and guidance to their lower-achieving counterparts. This interaction facilitates problem-solving and concept mastery within the tutees' ZPD, promoting the development of arithmetic skills more effectively than independent study. By working collaboratively, students are able to bridge gaps in their understanding through dialogue and shared problem-solving, making complex concepts more accessible and enhancing overall mathematical competence. The peer tutoring dynamic thus aligns seamlessly with Vygotsky's theory, demonstrating how guided learning interactions can elevate students' mathematical abilities.

Moreover, learners are expected to be responsible and proactive tutees, while tutors must be available and flexible in the mentoring process. The preparedness and willingness of tutees to learn are critical determinants of their behavior and learning achievement, which interacts with their capacity and preparedness (Poudel and Khadka, 2022; Wankiiri-Hale et al., 2020). The preparedness of both tutors and tutees is the key for the accomplishment of the tutoring relationship (Camayang & Bautista, 2021). Tutors, as peers, are influential in showing the relevance of learning outcomes while guiding and inspiring the learners to achieve these outcomes by the end of the process.

Guidance and motivation to learn mathematics may be either intrinsic or extrinsic to the learners. This can then shape the attitude and confidence of the tutees (Roberts & Spangenberg, 2020; Hendriksen et al., 2005; Loos et al., 2004; Blegur et al., 2019). Thus, in peer tutoring, tutees, especially slow learners, get individualized care and support, which can improve their confidence and intrinsic motivation to learn mathematics (Batool et al., 2021; Farooq et al., 2020).

Positive peer tutoring or mentoring depend on collaborative sessions, open communication, and close supervision using techniques such as spoon-feeding, modeling, and feedbacking. In mathematics, peer tutoring has many benefits in various aspects and needs to be extended to improve the quality of education (Hidayat, 2023) which may be used by mathematics teachers to improve their students' performance in the subject matter (Ycong, 2021). Action research conducted by Cuizon (2022), using peer tutoring as intervention in improving secondary learners in performance task and learners exposed that peer tutoring technique achieved better than to lecture-discussion strategy.

According to Arthur et al. (2022), peer-assisted learning directly helps students' attitude towards mathematics and enhances their interest in it. In the same way, the study conducted by Ullah et al. (2018) states that peer tutoring develops creativity and enhances problem-solving skills in both the tutor and the tutees. Because peer tutoring is a practical activity, it allows the tutors to realize the mental levels of their tutees and to understand the concepts being thought. Results are successful when tutors and tutees engage in cooperative work and meaningful tasks in a planned and organized program. Moreover, this method is useful for learners because peer tutoring allows discussion and learning in a congenial and friendly environment. It builds confidence and enhances the cognitive levels of introverted children because it helps the shy ones to utter themselves more freely in front of the class or other assemblies. Thus, the mutual and interactive side of peer tutoring not only develops mathematical understanding but also creates students' general and personal development.

The importance of mathematics can be obtained through the application of the four fundamental operations addition, subtraction, multiplication and division, and there are basic mathematical concepts to be taught in primary education level (Studocu, n.d.). Acquisition of these four basic operations'

concepts and their relations enable the students to develop their understanding of numbers and calculating strategies as well as associating them with their daily life activities. Since mathematics is embedded in different disciplines such as chemistry, biology, physics, geography and other disciplines, the teachers of these disciplines described from their experience that some of their student's encounter difficulties in performing simple mathematical operations.

Social Interdependence Theory by Johnson & Johnson (1989) as cited by Shimizu et al., (2023) exists when the outcomes of individuals are affected by their own and others' actions. Tutoring involves cognitive challenge from peers and post-interactive reflection. Both tutor and tutee have to fulfil their task to create social interdependence. Peer tutoring is a structured form of cooperative learning characterized by specific role taking as either tutor or tutee. One of the types of social interdependence that support this study is the positive interdependence in which it exists when individuals perceive that they can reach their goals if and only if the other individuals with whom they are cooperatively linked also reach their goals and therefore, promote each other's efforts to achieve the goals. Positive interdependence results in promotive interaction, wherein it may be defined as individuals encouraging and facilitating each other's efforts to complete tasks, achieve or produce to reach the group's goals. In connection, peer tutoring in which learners interact and help each other to accomplish a task have a huge effect to the fundamental arithmetic operations where they easily understand how to solve mathematical operations.

Social Constructivism developed by Lev Vygotsky (1968) as cited by Abderrahim (2021) is closely connected to cognitive constructivism with the added element of societal and peer influence. Social Constructivism focuses on the collaborative nature of learning. This theory indicates the peer tutoring develops from how people interact with each other, their culture, and society at large. Students rely on others to help create their building blocks, and learning from others helps them create their own knowledge and reality. Hence, through collaborative nature of learning in which learners interact with each other, it helps them to have knowledge in mathematical operations and also through the aid from their classmates, it helps them to create their building blocks and their own knowledge and reality.

Sociocultural Learning Theory developed by Lev Vygotsky (1978) as cited by (Pardillo et al., 2020) the major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition. This theory indicates the optimal amounts of peer interaction, or scaffolding, for more difficult activities so the students will be changed, it is defined as the distance between actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. Vygotsky, recognized that social settings and learning were entwined. Therefore, one must identify and implement strategies that are effective in a social context. One of the ways that students gain knowledge is when they collaborate with their peers or mentor on activities that involve problem solving and real-life tasks.

Piaget's Cognitive Development Theory (1971), as cited by the University of Hull (2023), posits that cooperation between peers fosters genuine exchange of thoughts and discussion. This aligns with Piaget's earlier research and theory in 1964, known as developmental constructivism, which suggests that humans create knowledge through the interaction between their experiences and ideas (Brau, 2020). These principles underscore the effectiveness of peer tutoring in enhancing fundamental arithmetic operations. By engaging in cooperative learning and exchanging ideas, students can construct their

understanding of arithmetic more effectively, thus reinforcing Piaget's view that knowledge is actively built through social interaction and personal experiences.

Section 5 (e) of Republic Act No. 10533 further strengthens the requirement of the Department of Education to follow some standards and principles in enacting the enhanced basic education curriculum, with specific pedagogical approaches such as constructivist, inquiry-based, reflective, collaborative, and integrative approaches. This legal framework ushers in educational practices characterized by active learning, critical thinking, and collaboration, and the aim of bringing up learners equipped with various abilities to deal with complex challenges. The RM 280 s. 2021 of DepEd Region 8 echoes such an objective by making emphasis on the need to develop numerate learners who can make use of numeracy skills across multiple situations. In emphasizing critical thinking and problem-solving in Mathematics instruction and design of assessment tools, the regional directive resonates with the larger legal framework to promote educational strategies that empower students to engage meaningfully with mathematical concepts. Peer tutoring, in this case, is a practical application of such principles, as it encourages collaborative learning, critical thinking, and problem-solving skills—all of which are important in enhancing basic arithmetic operations. Through peer tutoring, the students can become actively involved in mathematical concepts, benefiting from collaborative problem-solving experiences that strengthen principles both in the legal framework and the regional directive.

The Standards for the Organization and Operation of Preschools outlined in DO 107 s. 1989 emphasized the holistic development of a child aimed at helping them develop into self-propelling, critical-thinking beings who can make decisions to meet the challenges of future life. This is in line with Chapter 3, paragraph 4 of the DepEd Service Manual of 2000 Reviewer, where it stated that one of the aims of basic education is to provide the learners with knowledge, skills, attitudes, and values that are essential for personal growth and meaningful participation in a dynamic society. The stress on personal development, critical thinking, and social contribution highlights the need for well-rounded individuals. As such, peer tutoring may be considered a method that not only improves basic arithmetic operations but also develops other skills and values necessary for integral development, as stipulated in both educational standards. Through peer tutoring, the students engage in collaborative learning experiences that would promote critical thinking, problem-solving, and interpersonal skills—altogether essential for holistic development as envisioned in the educational standards.

This research determined the effectiveness of peer tutoring in enhancing fundamental arithmetic operations. The level of effectiveness of peer tutoring in terms of Motivation, Self-confidence, Readiness and the level of effects of the fundamental arithmetic operations in terms of Addition, Subtraction, Multiplication and Division were considered the main problem of the study.

## 2. Methodology

This research utilized the descriptive correlation research design using researchers' made questionnaire. A descriptive correlational design seeks the link between variables without attempting to manipulate any of them (Copeland, 2022, as cited in Tangonan, 2023). To establish the reliability of the questionnaire a pilot testing was administered to thirty-four (34) grade 3 learners of Dait Norte Elementary School. The tool was used to test its reliability was Cronbach's Coefficient Alpha which is a method of evaluating in guaranteeing the consistency of intended constructs (Izah. 2023)

For final data gathering, out of sixty-one Grade 3 learners, the questionnaires were distributed to the fifty-two selected Grade 3 learners of U-og Ubujan Elementary School in U-og, Inabanga, Bohol. After

the distribution, the data was collected and tabulated.

The gathered data were summarized, interpreted, and analyzed. With regards to the profile of the respondents, it was measured using percentage formula in terms of the age and sex. On the other hand, the level of the effectiveness of peer tutoring and the level of effects of fundamental arithmetic operations were measured using the weighted mean formula. Meanwhile, the correlation between peer tutoring and fundamental arithmetic operations was treated using Pearson Moment Correlation Coefficient Test.

## 3. Result and Discussions

This presents the findings, analysis and interpretation of the data gathered. It shown the respondent's profile in term of age, sex, the level of effectiveness of peer tutoring which was presented 3 sub-variables: motivation, self-confidence, readiness. In the level of effects of the fundamental arithmetic operations which was presented 4 sub-variables: addition, subtraction, multiplication, and division. It also tested the significant correlation between the effectiveness of peer tutoring and the fundamental arithmetic operations of Grade III learners School year 2022-2023 of U-og Ubujan Elementary School. The data presented in textual tabular, and graphical way as there are presented below.

**Table 1: Age of the Respondents**

|  | Frequency | Percentage |
|---|---|---|
| **8 years old** | 18 | 34.62% |
| **9 years old** | 30 | 57.69% |
| **10 years old** | 2 | 3. 85% |
| **11 years old** | 1 | 1.92% |
| **12 years old** | 1 | 1.92% |
| **Total** | 52 | 100% |

This study revealed that out of 52 (100%) respondents, there are 18 (34.62%) aged 8 years old, 30 (57.69%) aged 9 years old, 2 (3.85%) aged 10 years old, 1 (1.92%) aged 11 years old, 1 (1.92%) aged 12 years old. Therefore, most of the respondents were 9 years old. It is reflected in this table that 9 years old had the highest frequency of the respondents with the percentage of 57.69% followed by 8 years old with the percentage of 34.62%.

**Table 2. Sex of the Respondents**

|  | Frequency | Percentage |
|---|---|---|
| **Male** | 18 | 34.62% |
| **Female** | 34 | 65.38% |
| **Total** | 52 | 100% |

Out of 52 (100%) respondents, there were eighteen (18) males 34.62% and thirty-four (34) female 65.38%. It showed that most of the respondents were female. Therefore, females dominate in this study.

**Table 3: The Level of the Effectiveness of Peer Tutoring**

|  | Weighted Mean | Descriptive Interpretation |
|---|---|---|
| **1. Motivation** | 4.49 | Always |
| **2. Self-confidence** | 4.38 | Always |
| **3. Readiness** | 4.34 | Always |
| **Total** | 4.40 | Always |

Scale: 4.20 - 5.00 –Always, 3.40 - 4.19 –Often, 2.60 - 3.39 –Sometimes, 1.80 - 2.59 –Rarely, 1.00 - 1.79 –Never

Based on the responses that pertain to the effectiveness of peer tutoring, it reveals that the overall weighted mean of 4.40 interpreted as "Always." This means that the majority of the respondents learn more in fundamental arithmetic operations using the peer tutoring strategy. This supports the ideas proposed by Usman & Jamil (2019), as cited by Arthur (2022), stating that peer-assisted learning develops motivation among students in study groups, making them become more interested in their peers. In addition, peer tutoring has been reported to offer the opportunity for engagement and motivation, making the learners become more attentive to the task at hand. Roberts & Spangenberg (2020) further demonstrate that the learners who are exposed to peer tutoring techniques always perform better than those learners who were exposed to lecture-discussion strategies.

**Table 4. Fundamental Arithmetic Operations Test Performance**

|  | Descriptive Interpretation | F | w | f(w) | Percentage |
|---|---|---|---|---|---|
| **40** | Excellent | 0 | 0 | 0 | 0% |
| **36-39** | Superior | 12 | 37.5 | 450 | 23.08% |
| **32-35** | Very Good | 12 | 33.5 | 402 | 23.08% |
| **28-31** | Good | 9 | 30.5 | 274.5 | 17.31% |
| **24-27** | Fair/Passing | 11 | 25.5 | 280.5 | 21.15% |
| **20-23** | Conditional/Failure | 8 | 21.5 | 172 | 15.38% |
| **Total** |  | 52 |  | 30.37 | 100% |

Based on the response about the level of effects of the fundamental arithmetic operations in terms of addition, subtraction, multiplication, and division. Among 52 respondents, there were 12(23.08%) got 36-39 which is Superior, 12(23.08%) got 32-35 which is Superior, 9(17.31%) got 28-31 which is Good, 11(21.15%) got 24-27 which is Fair/Passing, 8(15.38%) got 20-23 which is Conditional/Failure. The overall weighted mean was 30.37, interpreted as "Good". This indicates that for learners to understand and master the fundamental arithmetic operations, teachers encouraged learner participation like peer tutoring as pair work and emphasized the importance of naming, explaining, and justifying the chosen a strategy like peer tutoring and highlighted the contextual differences in applying calculation strategies to solve different types of questions (Kazembe, 2023).

**Table 5. Correlation between Peer Tutoring and Fundamental Arithmetic Operations**

| | df | Computed r- value | Qualitative Description | Critical r- value | Result | Decision |
|---|---|---|---|---|---|---|
| **Peer tutoring and Fundamental Arithmetic Operation in Mathematics** | 50 | 0.413782 | Moderately Positive Correlation | 0.2732 | There is a Significant Effect | Null Hypothesis Rejected |

Based on the responses about the correlation between effectiveness of Peer tutoring and the Fundamental Arithmetic Operations. It revealed that there was a moderately positive correlation between effectiveness of Peer Tutoring and the Fundamental Arithmetic Operations of Grade III- Lily and Jasmine learners because the computed r- value of 0.413782 was greater than the tabular value of 0.2732 with 50 degrees of freedom at 0.05 levels of significance. Therefore, the null hypothesis is rejected. This means that there is a significant relationship between the effectiveness of Peer Tutoring and the Fundamental Arithmetic Operations. Peer tutoring is one of the strategies in improving mathematics achievement (Rosdianwinata et al., 2019). Peer tutoring is effective in improving students' understanding of mathematical concepts in the classroom learning process (Yoviyanti, 2024). Abuda and Jaromay (2021) unveiled that learner exposed to peer tutoring technique noticeably achieved better than exposed to lecture-discussion strategy. Hence, it is suggested that mathematics teachers should regularly use peer tutoring techniques to improve learners' mathematics performance. In short, peer tutoring can help learners on enhancing fundamental arithmetic operations in mathematics.

## 4. Conclusion

Based on the findings of the study, if peer tutoring is used by the teacher in the teaching and learning process, it can influence the learners' motivation, self- confidence, and readiness. Furthermore, peer tutoring is one of the strategies that can help and assist learners in enhancing fundamental arithmetic operations.

Thus, teachers shall assign tutors to the learners who need more improvement. Teachers may guide their learners properly to monitor if peer tutoring strategy is effective especially the motivation, self-confidence, and readiness of the tutees. Tutees shall be attentive to their tutors in order for them to improve their skills in solving mathematics problems.

## 5. Appendix

Effectiveness of Peer Tutoring in Enhancing Fundamental Arithmetic Operations Questionnaire

Part I: Profile of the respondents. Direction: Put a check (✓), supply your answer on the space

1.2 Sex: ( )female ( )Male

1.3 Age:

Part II: Peer Tutoring Scale

Direction: Please check the questions below. Write a check (✓) and check the places that indicate the level of frequency of the situation. This is not a test, so all the answers are correct.

(Palihug susiha ang mga pangutana sa ubos. Isulat ang tsek (✓) ug susiha ang mga dapit nga nagpakita sa lebel sa frequency sa sitwasyon. Dili kini pagsulay, busa ang tanan nga mga tubag husto.) Legend:

5- Always (kanunay) - (Excellently Proficient)

4- Often (Kasagaran) - (Very Proficient)

3- Sometimes (Panagsa) - (Proficient)

2- Rare (Talagsa ra) - (Not so Proficient)

1- Never (Dili gayod) - (Not Proficient at all)

## 2.1 PEER TUTORING IN TERMS OF MOTIVATION:

| STATEMENT | A (5) | O (4) | S (3) | R (2) | N (1) |
|---|---|---|---|---|---|
| 1. Peer tutoring helps me to become more motivated in solving mathematical operations. *(Ang pagtudlo sa kaubanan nakatabang kanako nga mahimong madasig sa pagsulbad sa operasyon sa matematika.)* | | | | | |
| 2. I actively participated in classroom activities when I'm with my partner instead of being passive learner. *(Aktibo ko nga moapil sa mga kalihokan sulod sa klase kon nagtrabaho ko sa akong kauban, aron dili ko mamahimong passive learner o dili mo apil sa kalihokan sa klase.)* | | | | | |
| 3. I become motivated to solve mathematics problems when I have a partner. *(Gibati nako ang kadasig sa pagsulbad sa mga problema sa matematika kung nagtrabaho ko sa akong kapares.)* | | | | | |
| 4. I am inspired in learning mathematics operations when I get praises from my partner. *(Nadasig ko sa pagkat-on sa math kung dayegon ko sa akong kapares.)* | | | | | |
| 5. I encouraged to continue the task when I have a partner that motivates me. *(Nadasig ko sa pagpadayon sa buluhaton kung naa koy kauban nga nagdasig kanako.)* | | | | | |
| 6. I am motivated to do classroom activities with my partner. *(Nadasig ko sa pagbuhat sa mga kalihokan sa classroom uban sa kong kapares.)* | | | | | |
| 7. I am eager to learn lessons in mathematics when I have a partner. *(Ganahan ko nga makat-on sa mga leksyon sa matematika kung naa ko'y kauban.)* | | | | | |
| 8. With the help of my partner, I am inspired to solve mathematical operation problems. *(Sa tabang sa akong kapares, madasigon ko nga mo sulbad sa mga operasyon sa matematika).* | | | | | |
| 9. I am excited to participate in class because I have a peer. *(Exited ko muapil sa klase kay naa koy kauban.)* | | | | | |

| | A (5) | O (4) | S (3) | R (2) | N (1) |
|---|---|---|---|---|---|
| 10. I can easily learn and motivated to formulate ideas through interacting with my classmates. *(Dali nakong magamit ang akong mga nakat-unan pinaagi sa paggiya sa akong kauban).* | | | | | |

## 2.2 PEER TUTORING IN TERMS OF SELF-CONFIDENCE

| STATEMENT | A (5) | O (4) | S (3) | R (2) | N (1) |
|---|---|---|---|---|---|
| 1. My peer helps me in developing my self-confidence that leads me to cooperate more in class. *(Ang akong kapares nagpauswag sa akong pagsalig sa kaugalingon).* | | | | | |
| 2. I am confident to learn and to solve math problems because I am guided by my peer. *(Masaligon ako nga makakat-on ug makasulbad sa mga problema sa matematika tungod kay ako giimpluwensyahan sa akong kapares.)* | | | | | |
| 3. Peer tutoring helps me to have an achievement in class which leads me to build self-confidence. *(Ang peer tutoring nakatabang kanako nga makabaton og kalampusan sa klase nga nagdala kanako sa pagtukod og pagsalig sa kaugalingon.)* | | | | | |
| 4. I gain confidence especially when my peer supports me when I am performing the activity. *(Nakabaton kog pagsalig sa akong kaugalingon ilabinakon ang akong kaedad nagsuporta kanakonsa dihang ako mo perform sa mga aktibiti.)* | | | | | |
| 5. I build my self-confidence through collaboration with my partner. *(Nakapataas nako ug kompiyansa ang pagbuhat kauban ang akong kapares).* | | | | | |
| 6. Being in a collaborative activity, it increases my self-confidence and interaction with other students. *(Ganahan ko kung naay collaborative activity o kauban sa pagbuhat sa buluhaton kay kini makapataas sa akong pakiguban ug ug pakig storya sa akong mga klasmit.)* | | | | | |
| 7. My peer helps me to boost my confidence and to be motivated on learning new things. *(Ang akong kapares nagtabang kanako nga madungangan ang akong pagsalig ug madasig sa pagkat-on sa bag-ong mga butang.)* | | | | | |
| 8. Peer tutoring builds my confidence that helps me to find a new friend. *(Pinaagi sa peer tutoring nakapadugang kini sa akong pagsalig nga nakatabang kanako sa pagpangita og bag-ong higala.)* | | | | | |
| 9. Peer tutoring improves my academic confidence, social skills and learning skills that enhance my learning. | | | | | |

| | A (5) | O (4) | S (3) | R (2) | N (1) |
|---|---|---|---|---|---|
| *(Pinaagi sa peer tutoring nakapauswag sa akong pagsalig sa akademiko, mga kahanas sa katilingban ug mga kahanas sa pagkat –on nga nakapauswag sa akong mga nakat-unan.)* | | | | | |
| 10. My peer helps me develop positive attitude towards learning and develop my self-confidence. *(Ang akong kapares nagtabang kanako sa paglambo og positibo nga kinaiya sa pagkaton ug paglambo sa akong pagsalig sa kaugalingon.)* | | | | | |

## 2.3 PEER TUTORING IN TERMS OF READINESS

| STATEMENT | A (5) | O (4) | S (3) | R (2) | N (1) |
|---|---|---|---|---|---|
| 1. Together with my peer, I am prepared and attentive to learn in the class. *(Kauban sa akong kapares, ako andam ug matinagdanon sa pagkat-on sa klase).* | | | | | |
| 2. Peer tutoring helps me to be prepared/ready to gain a lot of knowledge which I can also use to teach others. *(Pinaagi sa peer tutoring nagtabang kanako nga mahimong andam sa pag-angkon og daghang kahibalo nga magamit usab nako sa pagtudlo sa uban).* | | | | | |
| 3. Peer tutoring helps me to perceive that I am ready to do task and leads me to have a successful learning. *(Pinaagi sa peer tutoring nakatabang kanako nga masabtan nga ako andam sa pagbuhat a buluhaton ug nagtultol kanako sa usa ka malampuson nga pagkat-on.)* | | | | | |
| 4. My peer helps me to manage and plan my assignment and activities. *(Ang akong kapares nagtabang kanako sa pagdumala ug pagplano sa akong buluhaton ug mga kalihokan).* | | | | | |
| 5. During peer tutoring, I prepare myself and deepen my understanding of mathematics. *(Atol sa peer tutoring, akong giandam ang akong kaugalingon ug gipalawom ang akong pagsabot sa matematika).* | | | | | |
| 6. Through peer tutoring it helps me to become active during our mathematics class. *(Pinaagi sa peer tutoring nagtabang kanako nga mahimong aktibo sa klase sa math).* | | | | | |
| 7. My peer encourages me to become ready to master mathematical operations. *(Gidasig ko sa akong kaedad nga mahimong andam sa pagmaster sa mga operasyon sa matematika).* | | | | | |
| 8. I am prepared to participate in the class activities with my peer. *(Andam ako ug aktibong moapil sa mga kalihokan sa klase kon kauban ko magtrabaho ang akong kapares.)* | | | | | |

| | | | | |
|---|---|---|---|---|
| 9. With the guidance of my peer, I am prepared and ready to meet the academic challenges.<br>*(Uban sa giya sa akong kapares, ako andam sa pag-atubang sa mga hagit sa akademiko.)* | | | | |
| 10.) My peer encourages me to have willingness to learn the course material with confidence.<br>*(Ang akong kapares nag-awhag kanako nga adunay kaandam sa pagkaton sa mga materyales sa kurso uban ang pagsalig.)* | | | | |

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COLLEGE OF TEACHER EDUCATION
**TABLE OF SPECIFICATIONS: MEASURING THE FOUR FUNDAMENTAL**
OPERATION IN MATHEMATICS

| Topic<br><br>Fundamental Arithmetic Operation | Objectives | Number of Items | Cognitive level | | | Number of Class Sessions |
|---|---|---|---|---|---|---|
| | | | K-C | A | HOTS | |
| Addition | • Define the part of addition<br>• Solve 3 or 2-digit number by a 3-digit number<br>• Perform the operation of addition | 10 | 5-6 | 7-10 | 1-4 | 1 |
| Subtraction | • Define the part of subtraction<br>• Solve 3-digit number by a 4-digit number<br>• Perform the operation of subtraction | 10 | 11-14 | 17-20 | 15-16 | 1 |
| Multiplication | • Define the part of multiplication<br>• Solve 1-digit number by a 3-digit number<br>• Perform the operation of multiplication | 10 | 24-26 | 28-30 | 21-23 | 1 |
| Division | • Define the part of division<br>• Solve a 3 or 4-digit number by a 1-digit number<br>• Perform the operation of division | 10 | 32-35 | 36-40 | 31 | 1 |
| **TOTAL ITEM** | | **40** | | | | **4** |

Note: Multiple Choice Test – Type of Test
Formula:
Number of item= Number of class sessions x Desired total number of item
Total number of class session
Checked:


ALJOHN B. ANGCO                          JUVY B. TURTOGA
   Expert's Name                            Grade III Adviser


LORNA I. MANLIGUEZ                       BRENDESE B. NEUSANA
   Grade III Adviser                       Grade III Adviser


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Ngalan: _____

Direksyon: Lingini ang saktong tubag.

1. Si Rachel adunay 152 ka buwak. Gipun an siya ug hatag ni Mario ug 20 ka buwak. Pila man ka buwak ang anaa ni Rachel tanan?
a. 172 ka bulak
b. 127 ka bulak
c. 180 ka bulak
d. 107 ka bulak

2. Sa usa ka classroom, adunay 100 ka brown/kape nga lamesa, 1 red/pula lamesa ug 39 green/lutian lamesa. Pila man ka lamesa ang tanan?
a. 105 ka lamesa
b. 140 ka lamesa
c. 104 ka lamesa
d. 150 ka lamesa

3. Si Jack nigasto og P25.00 alang sa usa ka bolpen, laing P25.00 alang sa usa ka color box, ug P150.00 alang sa usa ka kahong lapis. Pila mann tanan ang iyang nagasto?
a. 125
b. 150
c. 175
d. 200

4. Adunay 60 ka yellow nga kalo, 46 ka blue nga kalo ug 60 ka pula nga kalo. Pila ang mga kalo didto?
a. 160 ka kalo
b. 177 ka kalo
c. 166 ka kalo
d. 150 ka kalo

5. Unsa ang proseso/pamaagi sa pagtipo sa duha ka numero sa pamaagi sa pagdugang?

a. Addition

b. Subraction

c. Multiplication

d. Division

**6.** Unsa ang imong tawag sa numero nga gidugang?

a. Subtrahend

b. Divisor

c. Minuend

d. Addends

**7.** 220+542=

a. 762

b. 627

c. 752

d. 772

**8.** 152+102=

a. 234

b. 242

c. 254

d. 284

**9.** 720+139=

a. 869

b. 859

c. 856

d. 846

**10.** 854+130=

a. 978

b. 972

c. 982

d. 984

**11.** Ang operasyon o proseso sa pagpangita sa diperensya (difference) sa numerong kuhaanan (minued) nga gikuhaan sa numerong tigkuha (subtrahend).

a. Pagdugang

b. Pagkuha

c. Pagpadaghan

d. Dibisyon

**12.** Ang simbolo/sign nga atong gigamit sa operasyon sa subtraction.

a. (-)

b. (+)

c. (x)

d. (/)

**13.** Unsa ang tawag sa tubag (Answer) human sa operasyon nga subtraction?

a. Subtrahend

b. Minuto

c. Kalainan/difference

d. Pagkuha

14. Unsa ang atong tawag sa numeronga kuhaanan/ minuend diin ang laing numero maoy tigkuhaa/subtrahend niini?

a. Subtrahend

b. Minuto

c. Kalainan

d. Pagkuha

15. Kung ang 200 ibawas sa 500, ang kalainan mahimong?

a. 100

b. 700

c. 200

d. 300

16. Si Mr. Cruz mokita ug 509php kada adlaw. Nigasto siyag 60php. Pila ka kuwarta ang iyang natigom?

a. P449.00

b. P390.00

c. P500.00

d. P409.00

17. 398-62=

a. 329

b. 336

c. 319

d. 328

18. 9,403-39=

a. 9,339

b. 9,349

c. 9,364

d. 9,359

19. 1,513-992=

a. 521

b. 545

c. 535

d. 525

20. 3,217-284=

a. 2,922

b. 2,933

c. 2,833

d. 2,923

21. Gipauban ni Andrew ang iyang mga higala alang sa gabii sa dula. Busa, nakahukom siya nga mag-andam ug snacks ug mga dula. Nagsugod siya, pinaagi sa paghimo og mini nga mga sandwich. Kung naa siyay 4 ka higala, moduol, ug maghimo siyag 3 ka sandwich para sa matag usa kanila. Pila ka sandwich ang iyang nahimo?

a. 7
b. 12
c. 10
d. 11

22. Nipalit kog 3 ka pakete sa biskwit ug ang matag pakete adunay 100 ka biskwit. Pila ka biskwit ang naa?
a. 300
b. 400
c. 200
d. 500

23. Si Angeline mipalit ug tulo ka dulaan. Matag duwaan gipresyohan og P25.00. Pila ang gasto sa 3 ka dulaan?
a. P30.00
b. P55.00
c. P60.00
d. P75.00

24. Kini ang proseso sa pagpadaghan sa mga numero?
a. Pagdugang
b. Pagkuha
c. Pagpadaghan
d. Dibisyon

25. Unsa ang imong tawag sa numero, nga gipadaghan sa laing numero?
a. Multiplier
b. Multiplikado
c. Produkto
d. Ang tanan sa ibabaw

26. Unsay tawag nimo sa resulta/tubag nga imong makuha kung mag multiply ka?
a. Hinungdan
b. Produkto
c. Multiplier
d. Multiplikado

27. 349x2=
a. 698
b. 620
c. 639
d. 689

28. 977x1=
a. 0
b. 977
c. 1
d. 488

29. 878x2=
a. 1,736

b. 1,726
c. 1,735
d. 1,756

30. 250x2=
a. 544
b. 501
c. 500
d. 600

31. Gitigom ni Serie ug sa iyang igsoong babaye ang tanang 98 sa ilang mga teddy bear ug gibutang kini sa mga estante sa ilang kwarto. Kung ang matag estante makadala ug labing taas nga 7 ka teddy bear, pila ka estante ang mapuno?
a. 14 ka estante ang mapuno
b. 15 ka estante ang mapuno
c. 16 ka estante ang mapuno
d. 17 ka estante ang mapuno

32. Unsa ang divisor kung ang 50 mabahin sa 5?
a. 5
b. 100
c. 50
d. 10

33. 30÷2=15. Unsa nga numero ang nagpresentar sa dividend?
a. 15
b. 2
c. 30
d. 0

34. Kini usa ka yano nga operasyon diin ang usa ka numero gibahin?
a. Pagdugang
b. Pagkuha
c. Pagpadaghan
d. Dibisyon

35. Ang numero nga pagabahinon gitawag.
a. Dibisyon
b. Multiplikado
c. Pagdugang
d. hinungdan

36. 100÷1=
a. 100
b. 1
c. 0
d. 10

37. 350÷5=
a. 60
b. 80

c. 70

d. 50

**38.** 420÷7=

a. 50

b. 60

c. 40

d. 70

**39.** 1200÷2=

a. 400

b. 500

c. 600

d. 700

**40.** 1800÷6=

a. 100

b. 200

c. 400

d. 300

## 41. Acknowledgement

## 42. Authors' Biography

Jacqueline L. Socorin, a distinguished faculty member at the College of Teacher Education of Buenavista Community College in Buenavista, Bohol, holds a Master of Arts in Education degree from Bohol Island State University-Clarin Campus. With her academic background and expertise, she contributes significantly to the educational landscape, particularly in the field of pedagogy. Notably, her research interests encompass the effectiveness of peer tutoring in enhancing fundamental arithmetic operations, shedding light on innovative teaching methodologies that promote collaborative learning and academic excellence.

Catherine J. Oyao's background as a College Instructor at Buenavista Community College, combined with her Bachelor's degree in Elementary Education from the same institution and her Master of Arts in Education from Cebu Technological University – Main Campus, with a specialization in Administration and Supervision, provides her with a holistic understanding of educational pedagogy and instructional strategies. Her educational pursuits bring into focus her commitment to effective strategies of teaching

and making a team out of educators. With a strong belief in the fact that education can make a huge difference in the lives of everyone, Oyao's study on the Effectiveness of Peer Tutoring in Enhancing Fundamental Arithmetic Operations is consonant with her professional ethos. Her aim is that such research will add to the enhancement of teaching practices and learning outcomes of her students, reflecting her commitment to shaping the educational landscape for the better.

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