

Bridging Learning Gaps in Grade 8 Science Through Structured Learning Activity Sheets

Janessa J. Nada

Adviser: Dagame O. Bohol

A Master's Thesis Presented to the Faculty of the Graduate Program School of Teacher Education

The National Teachers College

In Partial Fulfillment of the Requirements for the Degree

Masters of Arts in Education

Major in Science Education

Publication Date: 2026/09/30

How to Cite: Janessa J. Nada (2026), Bridging Learning Gaps in Grade 8 Science Through Structured Learning Activity Sheets. *International Journal of Innovative Science and Research Technology* 11(9), 1930-2021. <https://doi.org/10.38124/ijisrt/26sep967>

APPROVAL SHEET

This thesis hereto entitled, “**BRIDGING LEARNING GAPS IN GRADE 8 SCIENCE THROUGH STRUCTURED LEARNING ACTIVITY SHEETS**”, prepared and submitted by **JANESSA J. NADA**. In partial fulfilment of the requirements for the degree of **MASTER OF ARTS IN EDUCATION**, major in **SCIENCE EDUCATION**, has been examined and is recommended for acceptance and approval for **ORAL EXAMINATION**.

Dagame O. Bohol

Adviser

PANEL OF EXAMINERS

Approved by the Committee on Oral Examination

ELISA CRUZ, Ph.D.

Chair

PAOLO JOSEPH BLANDO and JUDEL ROMAN

Members

Accepted and approved in partial fulfillment of the requirements for the degree **MASTER OF ARTS IN EDUCATION**
major in **SCIENCE EDUCATION**

Comprehensive Examination passed on May, 2020.

DENNIS CABALLES, Ph.D.

Dean, School of Teacher Education

ACKNOWLEDGMENT

The researcher is expressing her heartfelt gratitude to the following focal persons who made great contribution in the realization of this research work:

President, The National Teachers College, for providing quality education and pursuits for excellence;

DR. DENNIS CABALLES, Dean, Graduate Studies for his dedication to his work and for sharing his knowledge and expertise in Educational Research Course as my professor which had improved the substance of this study.

DR. DAGAME O. BOHOL, Thesis Adviser, for sharing his expertise, suggestions and the time that contributed much in the accomplishment of this research.

DR. ELISA CRUZ, Chairman, Panel of Examiners, for her priceless suggestions and formative remarks on this study.

PROFESSOR PAOLO JOSEPH BLANDO and **PROFESSOR JUDEL ROMAN**, Members, Panel of Examiners, for their intelligent advice, genuine concern, comments and suggestions, which helped me a lot in the enhancement of this study;

DR. NERISSA L. LOSARIA, The Schools Division Superintendent, Division of Caloocan City, for her utmost support in the approval to administer the questionnaires to Kalayaan National High School;

DR. JUANITO B. VICTORIA, Principal IV, Kalayaan National High School, for allowing the researcher to conduct this research study and for allowing to float the questionnaire to the subjects of the study;

MR. ANTONIO. B. BRITA, Assistant School Principal, Kalayaan National High School, for his detailed comments and suggestions to improve the substance of the study.

MRS. IMELDA DG GALLARDO, Head Teacher VI, Kalayaan National High School for her support, for allowing the researcher to conduct this study.

Group of Master Teachers in Science Department namely; **Mr. Anthony P. Pertez**, **Mrs. Mirasol M. Abejuela**, **Mrs. Ma. Cristina H. Reyes**, **Mrs. Primadonna C. Capacete**, **Mrs. Jacquelyn T. Bautista** and **Mr. Christopher Pascual** for their support in the validation of the instruments.

MR. NEOGABRIEL B. CAGADAS, for the late night talks and suggestions, who helped the researcher enhance the study.

MR. EDWIN O. GUILLERMO, Master Teacher I, Talipapa High School, who unselfishly gave his comments and suggestions to improve the flow of the research study.

MS. ARBY PAZ, Teacher III, Kalayaan National High School, who contributed her comments and suggestions about the conduct of this study.

MRS. JOELA A. COSICO, **MRS. NENITA VILLANUEVA** and **MRS. LEA S. MAYORAL** for being my prayer warriors.

MS. JANA LIM for cooking special meal to my respondents and most of all for her assistance in the bookfold format of my Learning Activity Sheets.

Students from Grade 8-Sections 6, 24, 26 and 28 (Batch 2022-2023) for being cooperative.

Teachers of Kalayaan National High School, who sincerely extend their support for the accomplishment of this study.

Above all, our Heavenly Father, for giving the researcher all the wisdom and strength while making this thesis and for the countless blessings He bestowed upon me.

Janessa J. Nada

DEDICATION

This endeavor is lovingly dedicated to my husband, **Ricardo P. Nada**, daughters, **Immanuelle Rissa** and **Ishmaiah Rinnah**, and to the loving memory of my parents, **Vicente J. Jain** and **Josefina M. Estinor**. They are the most precious gifts God has given.

And finally, to our Heavenly Father and to the Lord Jesus Christ, for giving me strength, knowledge and wisdom, most especially for giving me firm determination to pursue and make this possible.

Janessa J. Nada

ABSTRACT

This study explored the potential of structured Learning Activity Sheets (LAS) to bridge learning gaps in Grade 8 Science at Kalayaan National High School. It examined students' performance before and after their exposure to the learning materials and identified the challenges they encountered during their use.

The study employed a quantitative research approach involving four randomly selected Grade 8 classes. Pre-test and post-test scores were used to determine the students' learning gains after the utilization of the Learning Activity Sheets. A t-test was employed to determine whether there was a significant difference between the students' pre-test and post-test mean scores. In addition, the students' evaluation of the Learning Activity Sheets was analyzed in terms of the challenges they encountered in using the materials.

The findings revealed that the pre-test mean percentage scores of the four Grade 8 classes were relatively low, with Grade 8-24 obtaining the highest mean percentage score of 39.67, followed by Grade 8-28 with 36.00, Grade 8-6 with 32.67, and Grade 8-26 with 30.67. None of the groups reached the 75% mastery level in the pre-test. After the utilization of the Learning Activity Sheets, the post-test results showed substantial improvement. Grade 8-24 obtained the highest mean percentage score of 85.00, followed by Grade 8-6 with 80.67, Grade 8-28 with 77.67, and Grade 8-26 with 74.67. The mean learning improvement was highest among Grade 8-6 at 14.40, followed by Grade 8-24 at 13.60, Grade 8-26 at 13.20, and Grade 8-28 at 12.50, with an overall mean improvement of 13.55 points. The computed t-values of 13.21, 13.51, 9.72, and 7.38 exceeded the critical value at the 0.05 level of significance, indicating a significant difference between the pre-test and post-test mean scores. The findings further showed that students encountered challenges related to the clarity, readability, printing quality, instructions, and presentation of the Learning Activity Sheets. Nevertheless, respondents positively accepted the inclusion of practice tasks, with a mean score of 2.53.

The findings indicate that the Learning Activity Sheets were effective in improving the students' performance in the identified least mastered competencies in Grade 8 Science. The significant improvement from the pre-test to the post-test led to the rejection of the null hypothesis. The study therefore recommends the continued use of Learning Activity Sheets as supplementary learning materials for addressing least mastered competencies, while improving their readability, printing quality, clarity of instructions, and presentation. Teachers and curriculum developers may further enhance and contextualize Learning Activity Sheets to meet the learning needs of students. Future researchers may examine their effectiveness across other grade levels, subject areas, and learning contexts.

Keywords: *Learning Activity Sheets, Least Mastered Competencies, Grade 8 Science, Learning Improvement, Academic Performance.*

TABLE OF CONTENTS

TITLE PAGE	1930
APPROVAL SHEET	1931
ACKNOWLEDGEMENT	1932
DEDICATION	1933
ABSTRACT	1934
TABLE OF CONTENTS	1935
LIST OF TABLES	1936
LIST OF FIGURE	1937
LIST OF APPENDICES.....	1938
CHAPTER ONE THE PROBLEM AND ITS BACKGROUND	1939
Introduction	
Background of the Study	
Literature Review	
Theoretical Framework	
Conceptual Framework	
Statement of the Problem (<i>Research Questions</i>)	
Hypotheses (<i>if applicable</i>)	
Scope and Limitation of the Study	
Significance of the Study	
Definition of Terms	
CHAPTER TWO METHODOLOGY	1949
Research Design	
Population and Sampling	
Respondents of the Study	
Research Instrument	
Data Gathering Procedure	
Data Analysis	
CHAPTER THREE RESULTS AND DISCUSSION	1958
Problem No. 1	
Problem No. 2	
Problem No. 3	
CHAPTER FOUR SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	1962
Findings	
Conclusions	
Recommendations	
REFERENCES.....	1964
APPENDICES	1966

LIST OF TABLES

1.	Number of Students and Their Scores.....	1952
2.	Pre-Test Scores of the Grade 8 Students.....	1958
3.	Post-Test Scores of the Grade 8 Students.....	1958
4.	Summary of the Pre-Test and Post –Test of Mean Scores of the Grade 8 Students and their Learning Gains.....	1959
5.	T-test Result of Pre-test and Post-test of the Grade 8 Students.....	1959
6.	Respondents’ Assessment on the Difficulties Experienced by Students in Using the Learning Activity Sheets.....	1960

LIST OF FIGURES

1	Cognitive Learning Theory.....	1944
2	The Learning Activity Model	1945
3	One Group Experimental Design.....	1945
4	ADDIE Model.....	1946
5	Research Paradigm.....	1947
6	Least Mastered Competencies for School Year 2021-2022.....	1950
7	Least Mastered Competencies for School Year 2022-2023.....	1951
8	Item Analysis of Grade 8-6.....	1953
9	Item Analysis of Grade 8-24.....	1954
10	Item Analysis of Grade 8-26.....	1955
11	Item Analysis of Grade 8-28.....	1956

LIST OF APPENDICES

A Letter of Request to Validators.....	1966
B Letter of Request to Conduct Study.....	1967
C Permit to Conduct Study.....	1968
D Parent Consent Form.....	1969
E Letter of Request to the Respondents.....	1970
F Table of Specification for 50-Items Test.....	1971
G 50-Items Test in Science 8.....	1972
H Table of Specification for 30-Items Test.....	1978
I 30-Items Test in Science 8.....	1979
J Survey Questionnaire.....	1982
K Learning Activity Sheet 1: Potential Energy in Sports.....	1983
L Learning Activity Sheet 2: Kinetic Energy All Around Us.....	1995
M Learning Activity Sheet 3: Ohms Law: Basic Electricity.....	2006
N Reliability Test Result.....	2018
O Item Analysis for Grade 8-6, Grade 8-24, Grade 8-26 and Grade 8-28.....	2019
P Certificate of Statistician.....	2021

CHAPTER ONE

THE PROBLEM AND ITS BACKGROUND

➤ Introduction

As the new decade opened, the educational landscape of the Philippines and almost all the countries globally had changed abruptly and drastically due to the deadly virus – COVID-19. This virus caused countries to go quarantine since this has been a worldwide health crisis. As this predicament goes further, a recorded number of almost 131 million positive cases, 74.5 million people recovered and 2.85 million noted death cases as of March of 2021 (World Health Organization, 2021). This translates to 795 thousand positive cases, 646 thousand recovered cases and 13,425 deaths as of the first quarter of 2021 (Rappler, 2021).

To mitigate such problems, the government opted to mandate an Enhanced Community Quarantine (ECQ). This obliged the government to provisionally shut down government offices, business establishments and educational schools, colleges and universities until prior notice in accordance with safety protocols. However, as a result of this state, more than a billion students were affected, estimated 28 million of which are Filipino learners from kindergarten to college. They, too, are necessitated to stay home to comply for the quarantine measures set forth by the Philippine Government (UNESCO, 2020)

To solve such problems, the Department of Education (2020) responded to substantial demand for education. It was the use of online platforms to give access to student learning. For some schools, modalities such as the use of TV and radio as well as modular and learning packets were offered to alleviate such problems. These ways are aimed to be established by streamlining the learning competencies to the most vital. In this way, the department sees the focus on the learning activities congruent to the time for mastery and content coverage (Department of Education, 2020).

In this way, the researcher looks at the research problem as practical-research that arises from the situation where the researchers are highlighting the setting and the activities that are happening. To justify, Rappler (2020) reported that last October 05, 2020, students went back to school pushing online platform usage and modular modality (Magsambol, 2020). With the same point, the Department of Education anchored on 'Sulong Edukalidad' which aims to bridge the gap between the present situation and the students' learning. This program will seek the participation of not only the teachers and students but also the parents, relatives and guardians (Department of Education, 2020). In addition to this justification, Higher Education Institutes had instigated policies for the continuation of schooling in spite of the closure. These plans include modified forms of online learning in different applications and software that intend to facilitate student teaching-learning activities and processes digitally (Oztok, 2013).

However, with the spectrum of the justification, the researchers also want to underline the deficiency at hand to stretch the need to continue understanding the study. In an observation by Rappler.com (2020), students without gadgets find it difficult to learn especially in a setting where online platforms are trendy. On the same note, teachers who lack training in technology face drastic changes due to technological challenges in virtual class.

The Department of Education (DepEd) assures that no student is left behind. Hence, comprehensive learning is one of the gist of the K to 12 Basic Education Curriculum. This upshot assures that all learners are given the compeer outlook to advance at their own trot through diverse learning activities. Extricated instructions and investigation allow teachers to help the learners contextualize their learning abilities. One of the primary considerations in school setting is academic underachievement at all levels.

However, in the reports of the Department of Education division of Caloocan (2023), most of the competencies per quarter were not able to be targeted due to the present situation, as well as the attunement to the modality being used. In the Least Mastered Competencies (LMC), the majority of the Grade 8 competencies were not achieved. These competencies were used in the creation of the Learning Activity Sheets of this study.

This study was conceptualized to address the need for the development of Learning Activity Sheets in Science for Grade 8 learners with least mastered competencies. Moreover, it is also focused on understanding how the Learning Activity Sheet will help improve the learners' mastery of concepts and the perceived effectiveness of the intervention material to the learners.

In response to the challenges brought by the pandemic, the Schools Division of Caloocan, under the leadership of Dr. Nerissa L. Losaria, Schools Division Superintendent, released a Division Memorandum (DM) No. 89 s. 2020, Clarification on the use of the Most Essential Learning Competencies (MELCs) and other related Issues, which emphasizes that starting on June 1, 2020, teachers shall be tasked to prepare weekly Learning Activity Sheets (LAS) and entrusted in managing multi-delivery options. This guideline addresses the need for teaching and learning delivery approach in the new normal. In addition, it also serves as another tool for intervention in the Least Mastered Competencies of Grade 8 Science.

However, aside from the initiative of the Division, our locale recorded the baseline presented from 20.1483 MPS of Academic Year 2020-2021, wherein it is based from the utilization of Self-Learning Module, it is an indicator of how students perceived their competencies.

In line with this, Academic Year 2022-2023 shows low MPS in their Summative Test for Grade 8 sections 6, 24, 24 and 28. As a form of Remediation Materials, there are Learning Activity Sheets to sustain the least mastered competencies of the given Grading Period.

This is the reason why the researcher dwelt the kind of research study for it arose in the locale where the researcher is situated. Thus, this was a practical-research problem. Needless to say, the aim of this research is to address the problem of the students who have least mastered competencies. In turn, it would help the institution alleviate the problem.

➤ *Review of Related Literature and Studies*

The following encompasses the related literature and studies both local and foreign sources through thematic approach. Such referential materials also provide information relevant in the current study.

• *Learning Activity Sheet (LAS)*

Research by Delos Reyes and Caballes (2021) states that the learning activity sheet is a measure of learner's activity in understanding to integrate or perform what they've learned. Nowadays, it is another form of learning modality together with Self-Learning Module (SLMs) due to the prevalent global health crisis they are experiencing right now.

In a statement from the policy under DepEd order No. 18 series of 2020, the primary objective of the institution is to provide learning resources with the assistance of the Basic Education-Learning Continuity Plan (BE-LCP). As a form of learning delivery, LAS is a material which is included to assess the learner's academic achievement.

To better achieve the learning delivery, DepEd Order No. 12 series of 2020, created the Most Essential Learning Competencies (MELCS) in response to the health crisis. Using the said material, it will only be bound to the topics, which is most essential for the learners. It is a transition from usual classroom-based instruction to limited tasks provided for the learners.

In relation to local study, the validated worksheets are identified as appropriate and commendable. The developed worksheets are appropriate to use as a material and enhance students' efficiency (Monding & Buniel, 2021).

According to Sayekti (2021) et al., using Design of Invention-Based Student Activity Sheets Technology to Improve Learning Outcomes of Cube and Block Volume, from the basis of the material expert team and discovery learning activity sheet media of students were feasible to use in learning wherein the basis is the response of students to their worksheets.

To further illustrate the role of LAS in the teaching and learning process, research conducted by De los Reyes and Caballes (2021), shows that students were able to appreciate LAS in a desirable manner. Thus, teachers also infer that it can be used as an instructional material as a worksheet based on the result of the study.

According to Fauziah (2019), employing worksheets based on contextual teaching and learning increases student comprehension of the subject. Wiratman et al 2019's study demonstrates that the outdoor learning activity sheet has a substantial impact on students' science process abilities. Consequently, there is also a considerable improvement in the outcomes of the student's test of science process skills after utilizing the outdoor learning activity sheet.

A study of De Lara (2017), using developed activity sheets, will serve as an agent of change for literacy of students. The said research is based from contextualization and location in Science 5 in regards to climate change adaptation.

In addition, activity sheets with scientific approach have a high value of validity, practical and effective. (Johan et.al, 2019).

• *Least Mastered Competencies*

In line with the Philippine K-12 Basic Education Curriculum, the LMC is one of the foundations for enhancing the present curriculum. There have been several researches undertaken regarding Least Mastered Competencies (LMC). One of them is a research by De Lara (2020) that highlights the use of e-assessment for the identification of the LMC, which serves as a road map for DepEd's urgent reaction to the current state.

On the other hand, the instances below indicate academic underachievement in diverse contexts:

According to Alves (2020), based on studies on the academic underachievement of the Luso-Canadian community, dropout rates, overrepresentation in special education and remedial reading programs, and extremely low rates of post-secondary education are the manifestations of an educational pandemic.

According to Maharani (2019), the adoption of the think-talk-write paradigm with scientific literacy has a positive influence on the learning ability of eleventh-grade MIPA SMA Kartika 1-5 Padang students. Academic underachievement, according to study conducted by De Jesus (2019), is the incapacity of learners to realize their full potential in regard to the topic of LMC. It is related to the learner's poor academic performance. According to a study done by Snyder and Anderson (2017), underachievement is the notion that an individual's accomplishments fall short of their projected potential.

According to several sources, using learning activity sheets to enhance students' skills and competencies is advantageous.

- *Effectiveness of Contextualized Learning Activity Sheets to Students' Learning*

In the study conducted by Dwikoranto (2020), the study's objective is to evaluate the effectiveness of the student activity sheet model in fostering scientific creativity, student learning outcomes, and student responses to the learning process. The research design included a pre-experimental, one-group, pretest-posttest structure. The focus of the study was the student activity sheet (SAS) model and the application of primary teacher Education undergraduates who programmed a science introduction concept course during Open University's 2019.1 registration. Data acquired utilizing tests and questionnaires with cognitive test instruments for products, cognitive process tests, scientific creativity assessments, and student questionnaire replies. The data were examined using the t-test, and proportions were computed.

Before applying the t-test, the normality test and homogeneity test are administered. Using normalized N-Gain, increased creativity and student learning outcomes are calculated. 1) An increase in students' scientific originality after enrolling in the medium category of instruction. 2) Improving student learning outcomes as a result of participation in effective learning activities. 3) Positive feedback from students to the learning procedure. On the basis of the information presented here, it can be stated that the deployment of the student activity sheet model in learning activities to enhance scientific creativity competency and student learning outcomes is successful (Dwikoranto, 2020).

In another study conducted by Delos Reyes and Caballes in 2021 on the role of Learning Activity Sheets to the improvement of instructional material, they have found out that each individual's particular interests and responsibilities as a citizen require an education. Utilization of instructional materials is correlated with the growth of knowledge and technology and is congruent with national and educational goals. The subject is conveyed by educators, and students absorb it via everyday chores that become routines. Learners require engaging instructional materials as a tool for acquiring knowledge during the learning process; hence, innovative learning materials are necessary to drive pupils to learn.

The purpose of the study was to determine the thoughts and opinions of the students on the use of Learning Activity Sheets (LAS), to solicit suggestions for enhancements from colleagues and other Science teachers, and to evaluate the existing LAS. The finding indicates that learners saw the LAS as neutral, indicating that it can serve as a useful educational resource. It might suggest that teaching materials should be unique and engaging in order to pique students' attention. In addition, more images on the LAS were cited as one of the enhancements by the instructors. The study suggests that while designing learning activities, it is essential to consider how students absorb new information, acquire new abilities, and develop new ways of thinking. Additionally, learning activities must be designed to facilitate the achievement of course and program objectives. The meticulous designing of learning events to fulfill these two goals is the process of activity design. Creating successful, high-quality learning activities begins with adherence to an established design approach. During and after each activity, learning outcomes must be evaluated to ensure that the activity provided the required level of comprehension. Additionally, the activity should be examined to determine how it might be enhanced for future usage (Delos Reyes and Caballes, 2021).

Meanwhile, the effectiveness of developing the worksheets or learning sheets for students was highly regarded by the study of Monding and Buniel (2021). The purpose of the study was to evaluate the efficacy of created worksheets as instructional materials for teaching certain science 9 themes. Specifically, the purpose of the study is to assess the evaluation scores of the worksheets created and the impact of their adoption. It also evaluates the considerable difference in academic achievement between respondents when helped by the worksheets. The major instrument of the study is a teacher-made learning activity sheet tailored from the least mastered competencies of students in Grade 8 science using First Quarter Lessons. Validators were the Masters Teachers of Science Department. The accomplishment performance of responders has significantly improved. There is a substantial gap in the academic accomplishment of kids using proven worksheets and conventional methods. The generated worksheets are suitable for use in teaching Science 9 subjects and considerably improve the students' efficiency that many students did not study outside of school, and that students' academic performance in Science, Mathematics and English Language was poor (Monding & Buniel, 2021).

Pandemic had affected the learning styles of students since they were all stuck in new modalities. In a study of Baherimoghadam (2021), the pandemic of COVID-19 has had a tremendous effect on schooling. e-Learning is getting increasingly popular. The happiness of the learner is a key objective of e-Learning; consequently, elements influencing this satisfaction must be carefully studied. This study intends to assess the impact of learning style and General Self-Efficacy (GSE) on student satisfaction with e-Learning (Baherimoghadam, 2021).

- *Remediation and Intervention*

Both remediation and intervention are designed to assist students in fulfilling the expectations that are set for their grade level. Remediation is frequently conducted shortly after the educational process for a specific skill or subject has come to a close. Teachers may need to reteach the material from the previous lesson in a different way in order to explain concepts that students have misunderstood. Intervention is often a technique that is more planned out and regulated, and it targets particular skills that students have not mastered, which results in gaps in their education. The teachers provide the students with additional instruction and use a monitoring tool to evaluate how well the students are doing with it (Jenkins, 2023).

Touch Math 123 (2022) noted that, since COVID-19 has redefined what it means to be "in the classroom," many instructors struggle with how to implement intervention and remediation via remote or distant learning. Using parents or caregivers as participants in the process is essential for effective reteaching, especially when striving to customize learning for our youngest kids. With their lesson plan, it is essential for teachers to provide direct teaching on a topic. Following the initial lesson, parents may assist their children in applying the principles in real-world situations. Asking a pupil to assist measure materials while making a meal or introducing guided reading are two simple ways to apply classroom arithmetic ideas to real-world circumstances. This allows parents to participate in their child's education and gives different learning routes, while being more accessible than a learning plan or worksheet. With the assistance of educators, parents and caregivers may develop methods to relate academic themes to their child's daily experiences and make learning more meaningful. Using the appropriate materials is another best practice for tailored intervention and remediation during distant learning. Technology can give the necessary tools for identifying learning gaps. Nowadays, many educators use AI and predictive analytics to identify pupils who are struggling with a particular idea or subject. After identifying pupils who have not understood a subject, teachers can begin individualizing instruction.

Asio and Jimenez (2020) evaluate the impact of remedial activities on the academic performance of fifth-grade students in the topic of Science. The study included a pre- and post-test experimental design. They picked two schools for the experiment, and each school had 50 students each class. They designated one institution as the control group and the other as the experimental group. The researchers collaborated with the individual Science teachers to determine the pupils' academic achievement. Initially, they performed a pre-test during their first period of instruction. The outcomes for both schools were unimpressive, leading researchers to recommend remedial measures for the experimental group. They encouraged the independent group to utilize conventional learning strategies. After the intervention, the researcher conducted a second round of evaluations based on the outcomes of the second grading period. The researchers performed a paired t-test to see if there were significant differences between the groups' scores. The study discovered a substantial difference in the students' test results following the intervention. Hence, the researchers came to the conclusion that remedial activities can impact students' academic performance.

It is best to conduct remediation in the classroom while students are engaged in other instructional activities. This can be accomplished by using a wide range of instructional methods and approaches, varying instructional strategies and presentations, giving students direct, constructive feedback, and providing positive reinforcement. Extended remediation should be organized as necessary in cooperation with school officials (such as the school counselor, administration, support team, and other teachers), who should also involve the student's parents. Tutoring, certain forms of instruction, and study sessions are all viable options for programs; however, they should not be the only options available. Remaining at the same grade level is not a kind of educational improvement (Albuquerque Public Schools, 2020).

Edmentum (2021) pointed out that remediation (or reteaching) entails, on a fundamental level, "reteaching" previously unlearned material. Before returning to grade-level learning, instructors may focus on missing, below-grade-level information as they identify misconceptions or misunderstandings. This is done early and for the benefit of all students during core education with the intention of preventing the majority of children from requiring more focused, intense treatments in the future. Without employing a formal procedure or even openly acknowledging their activities as deliberate reteaching, many teachers participate in remediation as a normal component of their lesson. In addition, remediation is frequently guided by formal or informal formative evaluation in order to get sufficient insight to identify the significant knowledge loss that students are suffering. For this strategy to be effective, teachers must employ a different method than the one originally employed, one that builds on prior learning and concentrates on the specific gaps in student understanding that were evident the first time around. Remediation or reteaching should ideally occur early in the learning process, before more skills are taught or more formal mastery assessments or summative examinations are performed.

- *Utilization of Learning Activity Sheets*

The Multigrade Education Program Team of the Bureau of Learning Delivery, Teaching and Learning Division (BLD-TLD), in collaboration with the United States (US) Peace Corps, developed Learning Activity Sheets (LAS) for English, Science, and Mathematics to support learners in mastering the knowledge and skills acquired from studying various lessons through the Self-Learning Modules. These Learning Activity Sheets (LAS) are intended to support learners in mastering knowledge and skills acquired from studying a variety of lessons (SLMs). The multigrade learners across all grade levels who were impacted by the shutdown of schools as a result of the COVID-19 epidemic will get these supplemental learning resources. Because the majority of these students are located in remote areas where they do not have access to the internet, digital learning resources, or sufficient

printed supplementary learning resources while they are learning at home, they have missed out on opportunities to acquire essential knowledge and skills due to the absence of an instructional program that is comparable to the one that is currently being offered.

According to the findings of the study of Cantonjos and Janer (2022), the Performance Level results in Pre-test for both the control group and the experimental group along the identified topic belonged to below 75 and were interpreted as indicating poor performance. On the other hand, the Performance Level results in post-test for the control group almost belonged to below 75, while those for the experimental group were almost in the bracket 85-89 and were interpreted as indicating very satisfactory performance. It has been demonstrated that using Learning Activity Sheets is an excellent method for improving problem-solving abilities with sample distribution. It also showed that they were able to solve problems involving sample distribution more easily and more quickly, as well as grasp the ideas better. In addition to this, it assisted students in improving their knowledge as well as their problem-solving abilities regarding distribution sampling.

In the study conducted by Sambayon (2020), during the 2017-2018 school year at San Jose Elementary School, the purpose of this study was to explore the impact that the deployment of contextualized teacher-made activity sheets had on the academic performance of students who were enrolled in Mathematics 5 classes. The specific comparison that was done was between the academic performance of students in a class that was instructed using contextualized teacher-designed activity sheets and students in a class that was instructed using traditional learner's material. In the study, there were a total of sixty participants, and the researchers used a quasi-experimental pretest-posttest control group design. A random selection was made to determine which of two heterogeneously organized sections of fifth grade would serve as either the experimental or the control group. Both groups experienced the same instructional material for the same length of time during each session.

The experimental group was provided with the therapy, which consisted of the use of contextualized teacher-made activity sheets; on the other hand, the control group was instructed with the utilization of traditional learner's material. A random selection of 30 individuals from each group was purposefully matched according to the final grades they received in grade 4. This study made use of an accomplishment exam in mathematics that included 30 questions and was created by the researchers themselves. The fact that the exam has a reliability value of 0.84 demonstrates that it is a legitimate and reliable tool for determining the degree of mathematical proficiency that the students have achieved. In order to analyze the data, we used methods such as frequency analysis, mean analysis, standard deviation analysis, and one-way analysis of covariance (ANCOVA). The first finding demonstrated that neither of the groups achieved a degree of mastery that was up to the standards set out. The second finding demonstrated that when compared, the performance of the experimental group was superior to that of the control group. The third finding demonstrated that there was a statistically significant difference between the experimental group and the control group in terms of the academic performance of the learners. This result suggests that the utilization of contextualized teacher-made activity sheets is an effective method for improving the academic performance of the learners (Sambayon, 2020).

- *Synthesis*

With the following gathered literature and studies on the effectiveness of Learning Activity Sheets in supplementing Least Mastered Competencies in Grade 8. With this being the matter, the researcher organized the review based on the key codes or variables that can be used in the study. These codes were: (a) Least Mastered Competencies, (b) Learning Activity Sheets, (c) Effectiveness of Contextualized Learning Activity Sheets to Students' Learning, (d) Students' Level of Performance, (e) Remediation and Intervention, and (f) Utilization of Learning Activity Sheets.

Delving deeper to the topic, Least Mastered Competencies, as the first code, was important to be highlighted in this study for it shall be the foundation of students that needed intervention. Thus, this is helpful as the criteria for the students to be chosen as respondents of this research study. Moreover, knowing the population of students falling under Least Mastered Competencies would greatly help the institution alleviate the problem in terms of the matter.

The second code, Learning Activity Sheets, would revolve around the mechanism to be used by the researcher in order to address the problem of students who have Least Mastered Competencies. Thus, Learning Activity Sheets are the tools needed to achieve the goal of this research. Furthermore, this needs to be highlighted for it can solve the problems of the students in understanding the lesson. If deemed necessary, these LAS can actually help the teacher as a supplementary guide for the students.

The code for "Effectiveness of Contextualized Learning Activity Sheets to Students' Learning" was gathered to see concrete evidence of the effectiveness of worksheets, activity sheets or learning activity sheets in helping students learn. In the context of the study, the Learning Activity Sheet was to alleviate the problem of the students who had problems and belonged to the Least Mastered Competencies. Thus, this part was important in either affirm or disaffirm the results of the gathered data of the research.

➤ *Theoretical Framework*

A learning activity model is a specialized interaction of learners with others that involves the use of certain skills and information (Delos Reyes, F & Caballes, D.,2021) It is relevant in the current study, in such a way that it is also focuses to the academic performance of the learners by using a material for the enhancement of students' skills and competencies.

Based on the study of Hornato, BT (2020), he concluded that upon using student activity sheets (SAS) by following the SAS model, it improves scientific creativity competency and student learning outcomes. On the other hand, SAS promotes integration of scientific capabilities of learners as manifested in their learning outcomes.

This study shows the relevance of Constructivism Theory – The primary objective of the constructivist approach to learning is to build knowledge based on actual experience, which means that knowledge is conditioned and predetermined by individual abilities, previous knowledge and by the experience of the learner. Teacher's main focus is the student, and not the learning content, while the goal is to engage students in research tasks in order to gain fundamental, efficient and quality knowledge (MAKSIMOVIĆ, J., MILANOVIĆ, A., 2020)

In line with *Workshop: Constructivism as a paradigm for teaching and learning* with unknown authors, Constructivist teachers pose questions and problems, then guide students to help them find their own answers. They use many techniques in the teaching process. For example, they may: prompt students to formulate their own questions (inquiry), allow multiple interpretations and expressions of learning (multiple intelligences) and encourage group work and the use of peers as resources (collaborative learning). In this regard, the ultimate goal of a Constructivist teacher is to help the learner grow in a creative manner to improve his or her capabilities.

According to Nicole, N. et al, 2022, student's engagement is also affected by behavior, cognitive and emotional dimension in relation to a particular worksheet activity. The study was anchored on the Cognitive Learning Theory (CLT) by Jean Piaget. The CLT has 4 stages of development and one of the four is the Formal Operational Stage (Cherry, 2019). It is in this stage, that students begin to think in abstract ways, in line with this is a period that students can appreciate ideas in science, especially when it comes to various learning materials, one of which is in the form of learning activity sheets, which is utilized as a remediation tool, to better improve students academic understanding of a given subject matter. In addition, it is also the phase wherein students developed their theoretical and abstract reasoning capability.

Students need learning aids that will capacitate their learning abilities in science, by providing learning activity sheets, will make their study habits more interesting as well as well engaging.

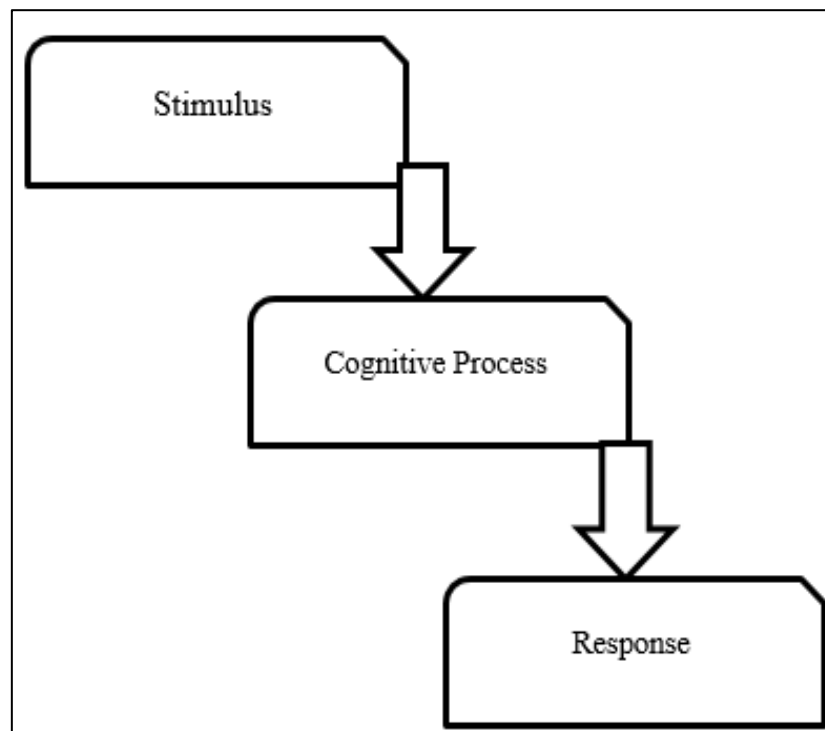


Fig 1 Cognitive Learning Theory

In the diagram illustrated in Figure 1, the external factors, information, or something that captivate the mind of the learners is the stimulus. The information, facts, or ideas that may be encountered by the learners, will be processed, depending on one's ability. In other words, internal factors may influence how learners respond to their learning themes. This cognitive learning theory further illustrates how the human mind works, particularly in the learning capability of an individual. If the young ones feed their minds with meaningful ideas and information for learning, it will influence how well they positively react to learning the lesson. Learning activity sheets can be a tool for the external factors or information that may be brought into the learners. It may help the learner to stimulate more information.

➤ Conceptual Framework

Studies showed that the use of Learning Activity Sheets has a significant impact on the performance of every learner, most especially under remediation materials. This tool is one way of helping students learn Science the way they accept it, in order to improve their academic performance.

In relation to the current undertaking of the researcher, learning activity sheets impact the level of student's engagement and understanding of a particular lesson in science.

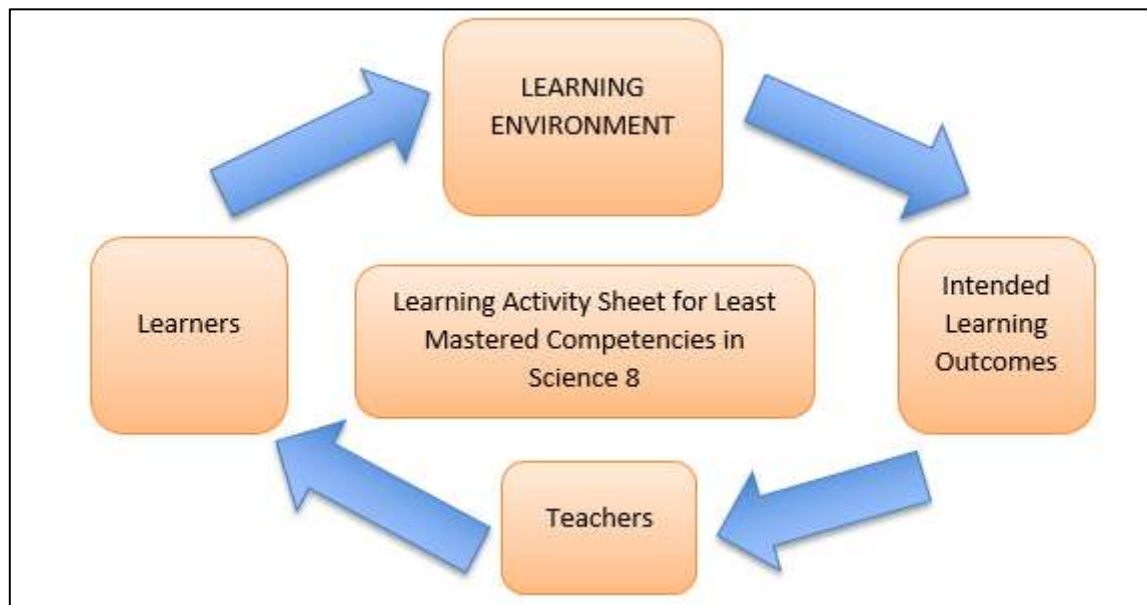


Fig 2 The Learning Activity Model. Adapted from Delos Reyes, F & Caballes, D, 2021, p. 202

This conceptual framework served as a guide in the conduction of the experiment that progressed within this research paradigm that helped the researcher to accomplish the requirement.

The experimental set was taken into consideration such that Learning Activity Sheets, were given to Grade 8 students with low academic performance in their Periodic Test:

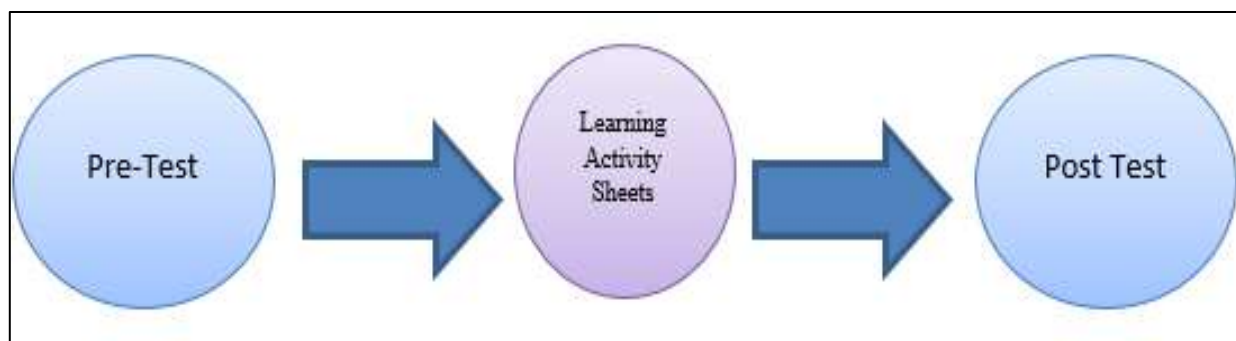


Fig 3 One Group Experimental Design

The graphical presentation shows the type of One Group research design. Wherein it is made up of Pre-Test, Intervention materials and Post Test. The illustrations, as reflected by Figure 2 and Figure 3, show the conceptual framework of the study.

In figure 2, the study shall employ the pretest – intervention – posttest design of the conceptual framework where after giving the pretest to students, they would be able to be exposed to the intervention (Learning Activity Sheets). Then, there will be a post-test embedded in the Learning Activity Sheets.

The conceptual model which served as guide in conducting this study is presented in Figure 4.

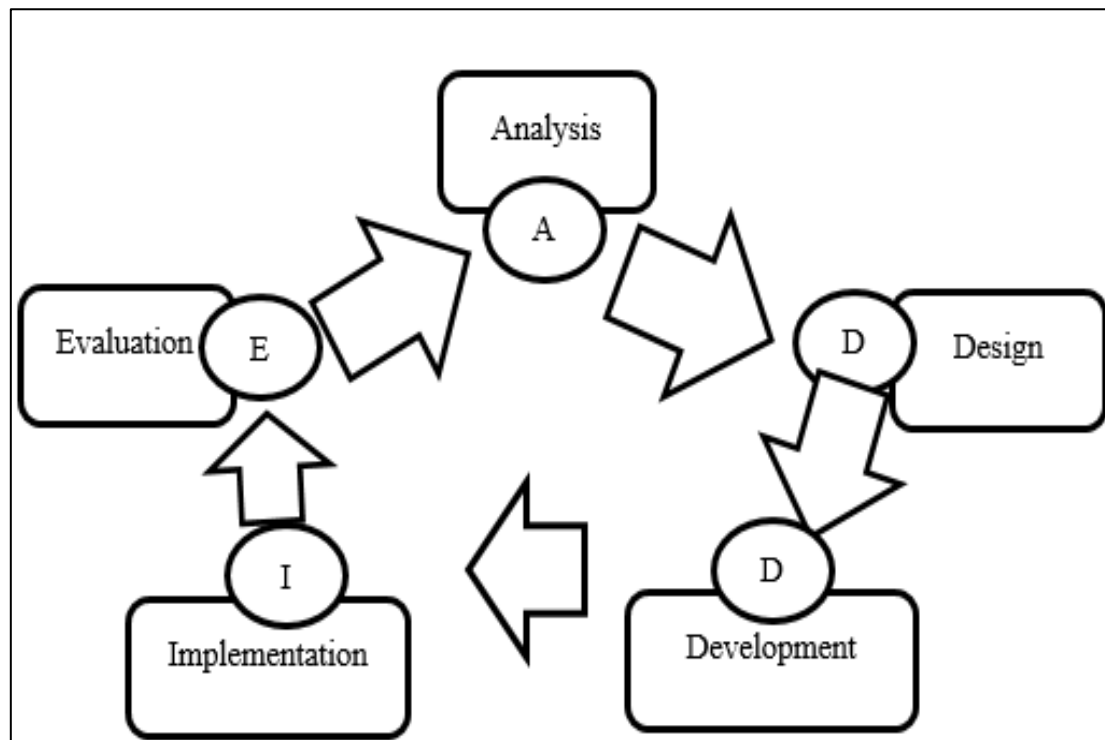


Fig 4 ADDIE Model

The conceptual model used in this study is the ADDIE model.

In the Analysis stage, the identification of Least Mastered Competencies was emphasized using Electronic Frequency of Correct Response Method with regards to First Periodical Examination in Grade 8 Science.

The Design stage, lay down the learning objectives, assessment instruments like teacher made tests, the competencies needed which is anchored with Most Essential Learning Competencies (MELCS) for school year 2022-2023 as well as a survey form for the goal of the study. upon using the Learning Activity Sheets. The design should be organized in the sense that there is an orderly method of identifying, developing and evaluating a set of planned strategies for achieving the goal of the study.

Development stage is the period when the researcher created, developed and assembled her learning activity sheets for this study. The said instrument has been reviewed and revised in accordance with the comments and suggestions received from the validators.

In the Implementation stage, the researcher conducted her study to selected Grade 8 students. It is the duty of the implementer that the Learning Activity Sheets should be utilized as a remediation tool to improve the academic performance of the learners. The content must be based on Most Essential Learning Competencies (MELCS) for the foregoing school year. The subject of the study should be aware of how to utilize the Learning Activity Sheets, wherein it is given on a one to one ratio.

In the Evaluation stage, formative and summative tests will be administered. However, summative evaluation consists of a teacher-made test, activity sheets, and a post test, which will be compared to the result of the pre-test. Then, a Survey Form will be administered to the students after accomplishing all the output.

- *Research Paradigm*

The flow of the study is presented in Figure 5.

The Input box includes the result of learners' pre-test scores, first periodical test scores and evaluation of the difficulties experienced by the students.

The Process box consists of Survey Questionnaire, Teacher-Made Test and Learning Activity Sheets.

The Output box, consists of evaluated learning activity sheets in Grade 8 Science and the possible suggestions offered by the respondents.

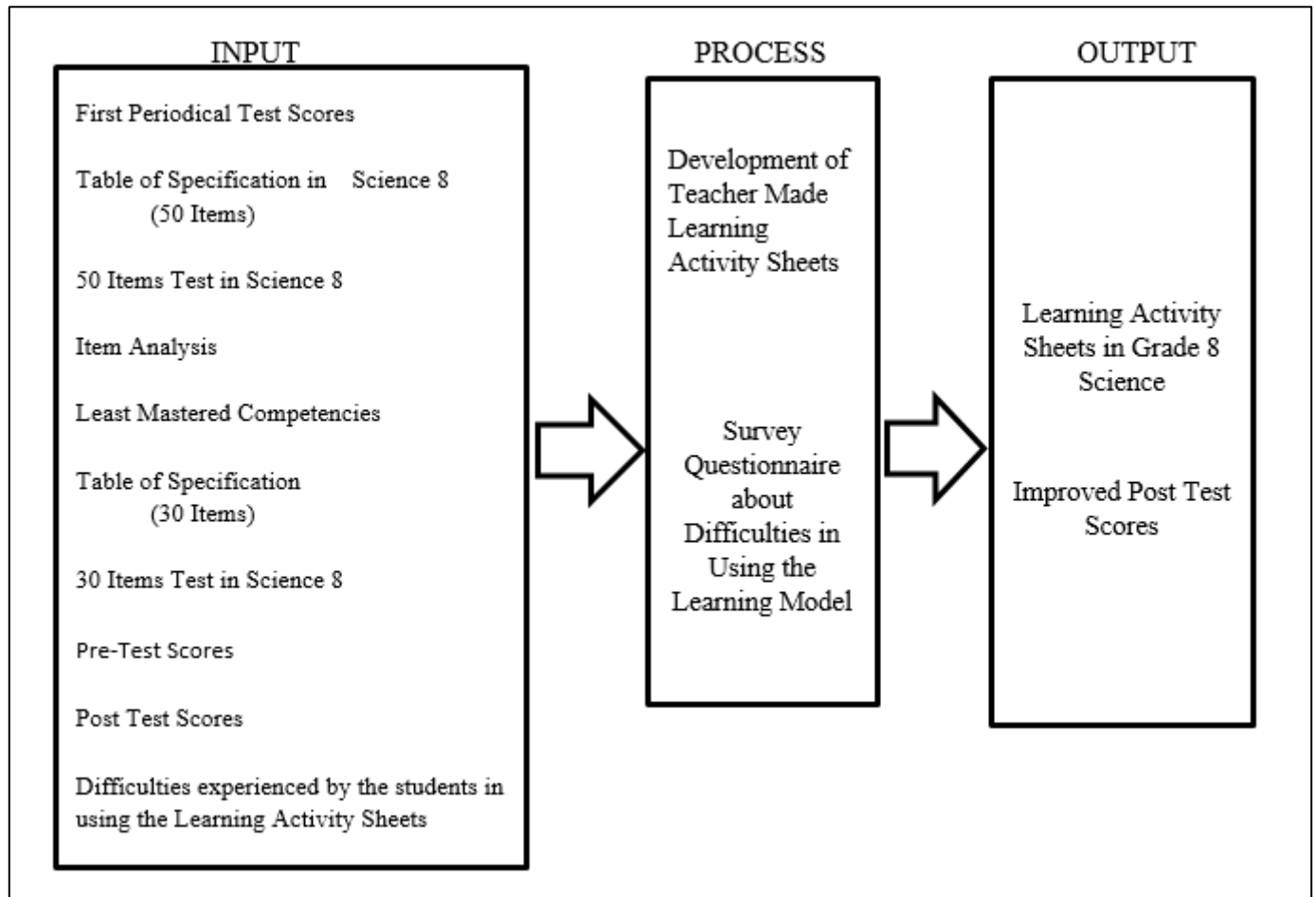


Fig 5 Research Paradigm

➤ *Statement of the Problem*

The researcher sought to answer the specific problems stated below:

- What is the result of the students' scores in terms of:
- Pretest; and
- Post-test?
- Is there a significant difference between pretest and post-test score on the use of Learning Activity Sheets?
- What difficulties are encountered by the students upon using the Learning Activity Sheets?

➤ *Hypothesis of the Study*

- H_0 : There is no significant difference between the pretest and post-test scores of the respondents with the presence of Learning Activity Sheets.
- H_1 : There is a significant difference between the pretest and post-test scores of the respondents with the presence of Learning Activity Sheets.

➤ *Scope and Delimitation of the Study*

The scope of this study seeks to determine the effect of Learning Activity Sheets in the Least Mastered Competencies of Grade 8 Science. It will be conducted at Kalayaan National High School using First Grading Lessons based on MELCS (Most Essential Learning Competencies). The result of the First Summative Test for Academic Year 2022 – 2023 shall be used to categorize students to be given the intervention.

This study is limited to the Learning Activity Sheet as another form of intervention for the Least Mastered Competencies in Grade 8 Science.

This will happen in School Year 2022 – 2023 with the provision of the Department of Education to have the classes for August – October in either distance learning, modular or any kind of modality other than face-to-face. For November and to the rest of the School Year, it shall be purely face-to-face if deemed no abrupt increase in the number of affected cases of COVID-19.

➤ *Significance of the Study*

This study aimed to analyze the effects of Learning Activity Sheets (LAS) in the Least Mastered Competencies of Grade 8 Science. The result of this study will be beneficial to the following institution:

- *Students.*

This study can be a way to make the students aware of how the learning activity sheets will serve as an intervention towards the pursuit to better academic performance that creates impacts to their academic achievement and in return to become successful in their chosen field.

- *Teachers.*

That amidst the existing global pandemic, there is another way for alternative learning delivery to improve the level of academic achievement.

- *Parents.*

This study would give them insights to understand the capabilities of their students in coping to their struggles pertaining to their academic performance.

- *Master Teachers and Department Heads.*

This study would pave the way for the improved level of instruction and capacitance of the abilities of teachers to become more creative in improving the level of competencies of each learner.

- *Principal.*

To the educational leader of school, that Learning Activity Sheets (LAS) of students are the benchmark and forefront of competencies

- *Curriculum Developers.*

To the Curriculum Developers that there would be enhancement of curriculum in the form of intervention using Learning Activity Sheets (LAS).

- *Future Researchers.*

This study can add information to the vast and unanswered questions about Learning Activity Sheets in relation to students' academic achievement.

➤ *Definition of Terms*

The theoretical (a) and operational (b) definitions of technical terms are indicated below:

Academic underachievement, in this study, it means that, it is the perceived failure to reach potentials of learners (Guilles, 2008)

Learning Activity Sheet, in relation to the study, is developed based on the standard of content eligibility, language feasibility, graphic feasibility, and feasibility of presentation (Johan et.al, 2019).

Least Mastered Competencies – are competencies which were underachieved by the students in an academic quarter (Monding & Buniel, 2021).

Structural Design – deals with the overall appearance of the learning activity sheets which includes the cover, font styles used by every texts, graphics, figures, size and style.

CHAPTER TWO

RESEARCH DESIGN AND METHODOLOGY

This chapter explained the research design, sampling procedures, the instrument of the research, the preparation and validation of the instrument, gathering of the data and the statistical treatment to be used for the analysis of the data accumulated.

➤ *Research Design*

The research shall be using a Quantitative Research Approach. Quantitative research, according to Bhandari (2022) involves the collection and interpretation of numerical data. It may be used to identify patterns and averages, make predictions, examine causal linkages, and extrapolate results to larger groups. Quantitative research is the antithesis of qualitative research, which involves the collection and analysis of non-numerical data (e.g. text, video, or audio).

A true experimental design is a statistical method for determining the cause-and-effect relationship between several variables. This is one of the most precise types of study designs, providing considerable evidence for the presence of links (Voxco, 2021). In addition to that, there are three conditions that must be satisfied for experimental research to be considered valid: (a) Existence of a control group, which is the sample of participants is separated into two groups, one of which is exposed to the experiment and so undergoes changes, and the other of which is not; and (b) The presence of a variable independent: There must be independent factors that impact the functioning of other variables in order for the researcher to monitor and control changes.

Because the students received remediation utilizing the Learning Activity Sheets, a single group Pretest–Posttest design was utilized. The pre-test and post-tests were administered and compared to establish the intervention's effectiveness. Due to the nature of the problem at hand, the researcher chose to employ this methodology. Since the Learning Activity Sheets are a remedial tool, Face to Face Modality students have been selected for data collection. This research utilized solely data collected from the experimental group. In addition, there will be a survey form about the difficulties encountered by the students upon using the Learning Activity Sheets.

The study shall also make use of Descriptive Research Design. The objective of descriptive research is to precisely and methodically characterize a population, situation, or phenomena. It can answer queries about what, where, when, and how, but not why. To explore one or more variables, a descriptive research design may employ a vast array of research methodologies. In observational research, the researcher does not change or control any of the variables; instead, he or she only observes and measures them (McCombs, 2022).

This can be translated to the study in terms of administration of 50 Items Test in Science 8 after which, item analysis follows, by identifying the Least Mastered Competencies of Grade 8 Science. The researcher created a supplementary material, which is Learning Activity Sheets to help the students in their learning process. After the utilization of Learning Activity Sheets, administration of Post Test will be me These are important matters to take in consideration for the intervention of the research study.

➤ *Sampling Procedure*

The study will be using the purposive sampling technique. Purposive sampling, also known as judgmental, selective, or subjective sampling, is a kind of non-probability sampling in which researchers depend on their own discretion when selecting survey participants from the community. This survey sampling technique necessitates that researchers have previous knowledge of the goal of their studies in order to effectively choose and contact qualified participants for online survey platforms (Alchemer, 2021).

In this being the matter, the respondents will be chosen after the result of the First Summative Test of Academic Year 2022 – 2023. Those students who shall have a failing mark will be subject for the study since this is the use of the Learning Activity Sheet (LAC).

➤ *Instrument and Techniques Used*

The research study shall utilize several tools in order to achieve the goals of the Statement of the Problem.

- The Learning Activity Sheets (LAS) in Least Mastered Competencies –

First Quarter. These Learning Activity Sheets were crafted by the researcher from the basis of least mastered competencies. Thus, this was validated by Grade VIII, Master Teachers I . The Learning Activity Sheets shall be given to the students on the different components that had achieved a lower score. Thus, this shall be reflected in the First Quarter Summative Test and the Table of Specifications made by the researcher. Thus, students shall be categorized to what LAS shall be issued to them. This shall come in three sets as reflected to the topics discussed in the First Quarter. The following are the thematic presentation of LAS:

- ✓ Learning Activity Sheet 1- Potential Energy In Sports
- ✓ Learning Activity Sheet 2- Kinetic Energy All Around Us

✓ Learning Activity Sheet 3 – Ohms Law: Basic Electricity

The Least Mastered Competencies from School Year 2021-2022 are shown below:

LEAST MASTERED COMPETENCIES	
Grade 8 Science	
School Year 2021-2022	
QUARTER 1	1. Apply the law of interaction to falling bodies and to activities like walking and swimming as well as to jet and rockets 2. Determine the effect of temperature on the speed of sound 3. Relate heat to mass and temperature through the concept of specific heat capacity 4. Discuss the relationship of current to voltage and resistance in an electric circuit 5. Calculate the heat absorbed or released to raise or decrease the temperature of a substance
QUARTER 2	1. Simulate the impacts of asteroids and comets on Earth 2. Illustrate instruments used in tracking tropical cyclone 3. Describe the effects of the eye and eyewall of the typhoon as it passes through an area 4. Explain how seismic waves are used to describe the interior of the Earth 5. Discuss the scale adapted in the Philippines to describe the intensity and magnitude of an earthquake.
QUARTER 3	1. Determine the number of electrons, protons, and neutrons in an atom 2. Describe the predict the elements' trend in the PT with respect to its density and melting point; and ability to react with oxygen 3. Describe the predict the elements' trend in the PT with respect to its reaction with water and reaction of metals with non-metals and vice versa 4. Explain how chemical change affects the chemical composition of a material (molecular level) 5. Differentiate the structure of solids, liquids, and gases based on its density and specific gravity
QUARTER 4	1. Illustrate how ingestion, absorption, assimilation, and excretion take place in the interaction of Digestive System with the circulatory, respiratory and excretory system 2. Differentiate spermatogenesis to oogenesis using graphic organizer and state the significance of meiosis in maintaining the chromosome number in each process 3. Describe the changes that occur in each stage of meiosis 4. Solve problems involving Mendelian Genetics (Monohybrid & Ditybrid) 5. Identify the genotypic and phenotypic ratios of offspring in the standard monohybrid
<i>I hereby certify that the above information about Least Mastered Competencies(LMC) for Science VIII, School Year 2021-2022 are true and correct based from Item Analysis conducted in Kalayaan National High School.</i>	
Reviewed by:	Anthony P. Pertez Master Teacher II
Approved by:	IMELDA B. GALLARDO Head Teacher VI
Purpose:	For Research Study entitled " Effectiveness of Learning Activity Sheets n the Least Mastered Competencies in Grade VIII Science"
	Janessa J. Nada Researcher

Fig 6 Least Mastered Competencies for School Year 2021-2022

LEAST MASTERED COMPETENCIES
Grade 8 Science
School Year 2022-2023

QUARTER I

1. Define gravitational potential energy
2. Determine the factors that affect gravitational potential energy gained by an object
3. Calculate the potential energy of an object
4. Define kinetic energy
5. Determine the factors that affect kinetic energy gained by an object
6. Calculate the kinetic energy of an object
7. Differentiate gravitational potential energy to kinetic energy
8. Infer the relationship between current and voltage
9. Define current, voltage and resistance
10. Discuss the relationship of current to voltage and resistance in an electric circuit

I hereby certify that the above information about Least Mastered Competencies(LMC) for Science VIII, School Year 2022-2023 are true and correct based from Item Analysis conducted in Kalayaan National High School.

Reviewed by:

Anthony P. Pertez
Master Teacher II

Approved by:


IMELDA DG GALLARDO
Head Teacher VI

Purpose:
For Research Study entitled "Effectiveness of Learning Activity Sheets n the Least Mastered Competencies in Grade VIII Science"


Janessa J. Nader
Researcher

Fig 7 Least Mastered Competencies for School Year 2022-2023

➤ *Comparison of Least Mastered Competencies*

From School year 2021-2022, the stated file shows the topics/lessons of least mastered competencies from the Report of Science Department Head.

While in School Year 2022-2023, the least mastered competencies was based from 50 items test from all the Most Essential Learning Competencies (MELCS) under first quarter.

- 50 Item Test was designed to determine the Least Mastered Competencies of Grade VIII Science students which is made up of Most Essential Learning Competencies under First Quarter and the basis of content for crafted supplementary material.
- Pre-Test was devised in connection with the competencies from 50-item test that are needed to achieve by the students. It is a 30-item pretest in Science 8, based from extracted least mastered competencies from the Item Analysis. This was administered by the researcher in all of the respondents. A letter was given to the students. This was done before the dissemination of the Learning Activity Sheets to Grade 8.
- Post Test was given after the series of teaching and learning process using Learning Activity Sheets. This was a 30-item post-test.
- Survey of Difficulties experienced by the students upon using the Learning Activity Sheets. This followed up the needed information to back up the importance and the highlight of the Learning Activity Sheets in Grade 8.

➤ *Validation*

The Learning Activity Sheets were validated by the experts in teaching Science. This was crafted by the researcher on the basis of least mastered competencies of the learners. This was validated by Science Department Master Teachers. After that, the content was validated by two Master Teachers of the institution. After revising, the LAS was validated by a Language Editor. Then, it was given to the technical and Lay-out Graphic Artist for assessment. The researcher personally printed all colored Learning Activity Sheets for the respondents.

The other survey included by the researcher is also a teacher-made survey questionnaire about difficulties experienced by students in using the Learning Activity Sheets. This was verified by the adviser of the research study and underwent validation of the Master Teacher in English Department.

➤ *Data Gathering Procedure*

In National Teachers College, the initial requirement before data gathering is the Application and Approval of Ethics Review Committee. Then followed by the proceedings to the conducting of study.

The table shows number of students and their scores in their First Periodical Test.

Table 1 Number of Students and Their Scores

Grade and Section	Number of Students
Grade 8-6	10 students got 15 test scores and below out of 50 items
Grade 8-24	10 students got 15 test scores and below out of 50 items
Grade 8-26	10 students got 15 test scores and below out of 50 items
Grade 8-28	10 students got 15 test scores and below out of 50 items

After getting the number of students having low scores in their First Periodical Test in Science 8, the researcher shall be sending a letter to conduct a study in Schools Division Office-Caloocan City endorsed by the School Principal then will wait for the approval of Letter to Conduct Study. When the researcher, receive the Permit to Conduct Study. Then, data gathering procedure will follow.

Once approved, the researcher shall be informing the students including their parents that they will be part of the study using a Parent Consent Letter. Once informed, students will give the Parent Consent Letter to the researcher with Parent's Signature. Then, the researcher shall be administering a 50 Item Test.

The first step is the administration of pilot test for Grade 9 section 3 students about 50 Item Test in able to determine the Least Mastered Competencies. The test results will be evaluated by the statistician for Reliability Test. Once, approved and verified, the researcher will administer the 50-item test to the Grade 8 Students, focusing on a the Most Essential Learning Competencies of First Quarter in Science 8. This will determine the Least Mastered Competencies, which will be served as a tool to create another set of 30 item test as pre-test and post-test focusing on the content of teacher-made Learning Activity Sheets on the context of Least Mastered Competencies.

The following are the result of Item Analysis from the 50 Item Test:

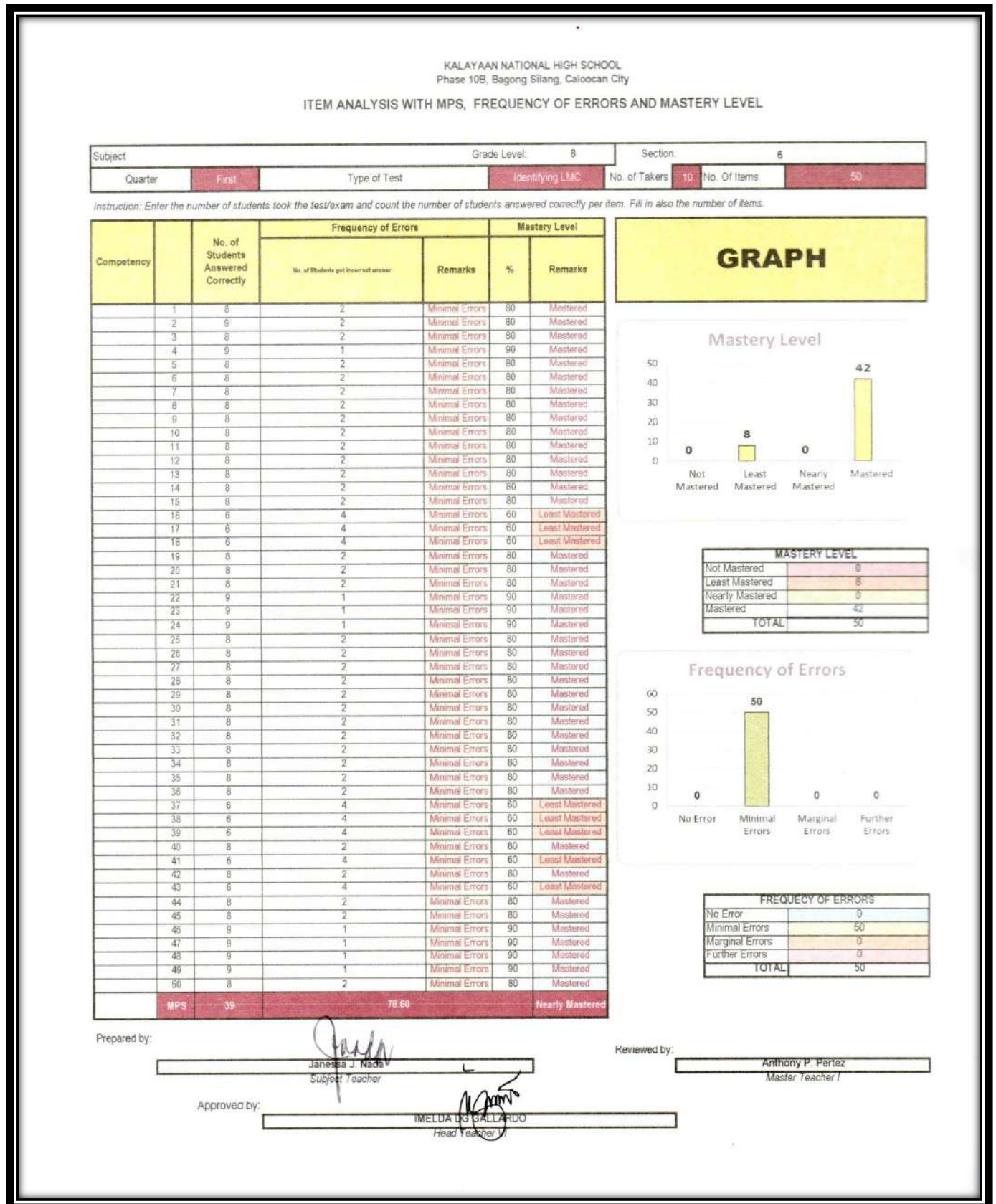


Fig 8 Item Analysis of Grade 8-6

• **Interpretation:**

The Least Mastered Competencies from Grade 8-6 shows Item No. 13, 14, 16, 17, 18, 37, 38, 39, 41 and 43. With a total of eight (8) Least Mastered topics. These test questions pertaining to the following: Potential Energy, Kinetic Energy and Ohms Law. The Mean Per Score (MPS) is equivalent to 78.60, wherein the Mastery Level is Nearly Mastered.

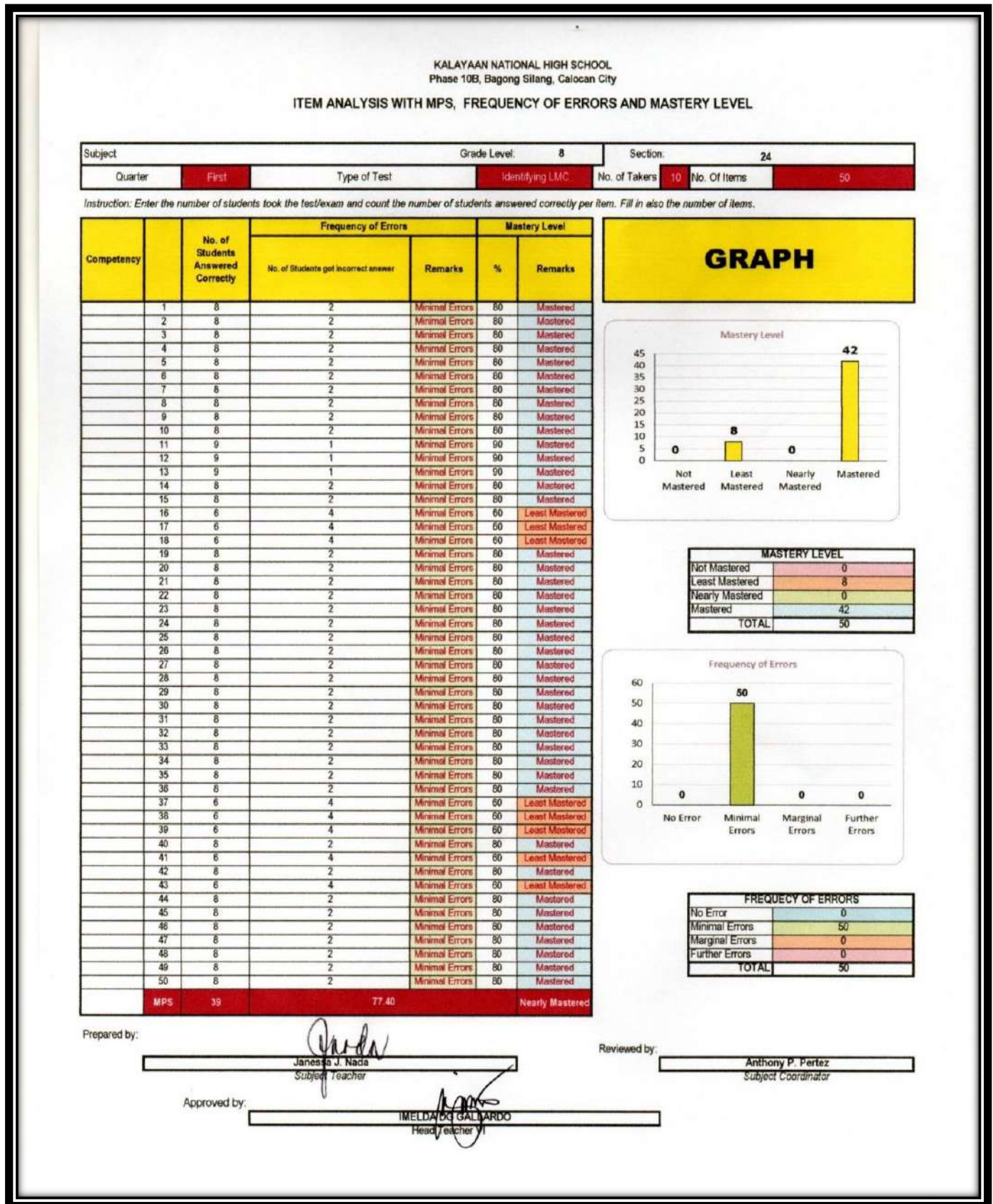


Fig 9 Item Analysis of Grade 8-24

• **Interpretation:**

The Least Mastered Competencies from Grade 8-24 shows Item No. 13, 14, 16, 17, 18, 37, 38, 39, 41 and 43. With a total of eight (8) Least Mastered topics. These test questions pertaining to the following: Potential Energy, Kinetic Energy and Ohms Law. The Mean Per Score (MPS) is equivalent to 77.40, wherein the Mastery Level is Nearly Mastered.

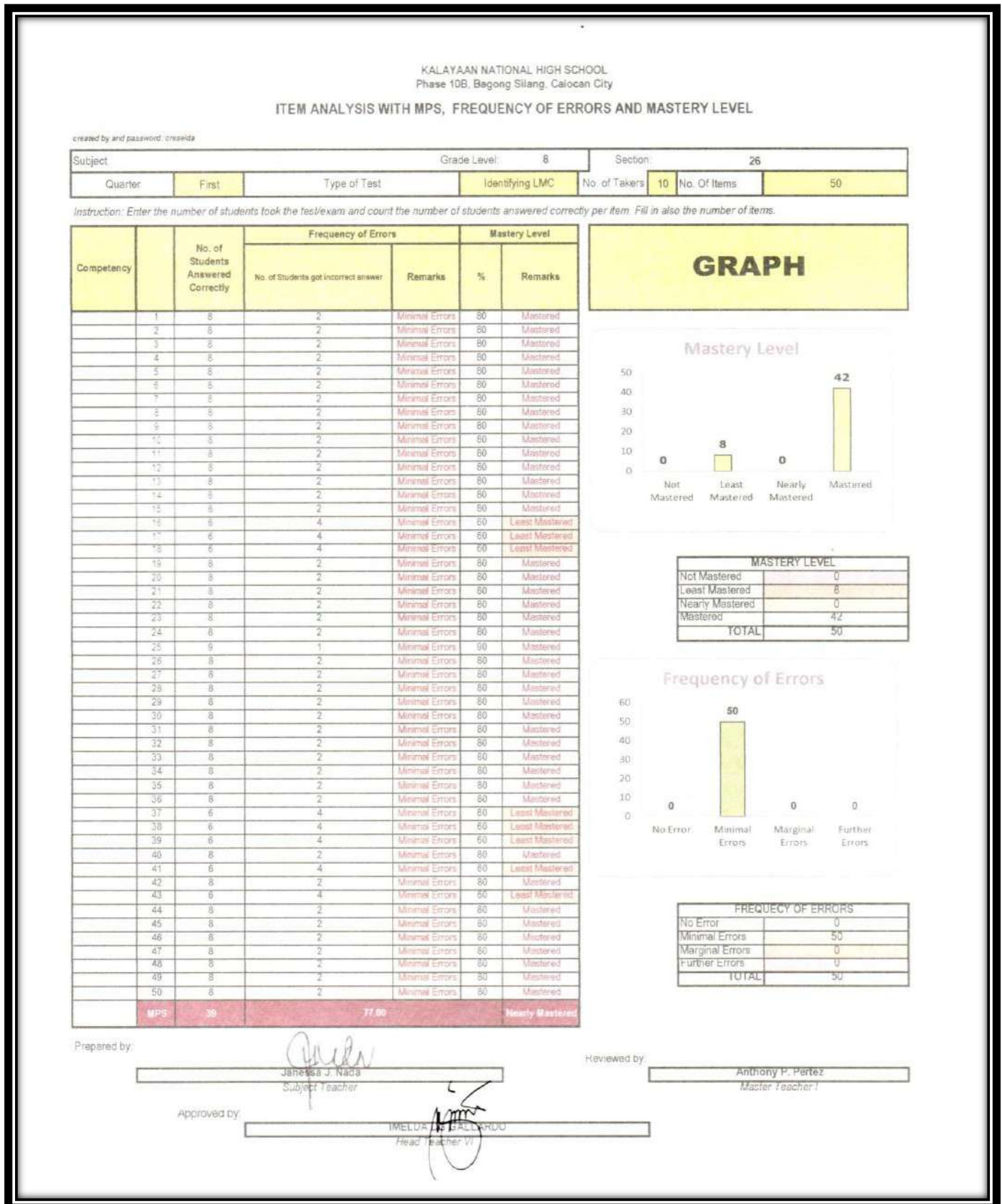


Fig 10 Item Analysis of Grade 8-26

• **Interpretation:**

The Least Mastered Competencies from Grade 8-26 shows Item No. 13, 14, 16, 17, 18, 37, 38, 39, 41 and 43. With a total of eight (8) Least Mastered topics. These test questions pertaining to the following: Potential Energy, Kinetic Energy and Ohms Law. The Mean Per Score (MPS) is equivalent to 77.00, wherein the Mastery Level is Nearly Mastered.

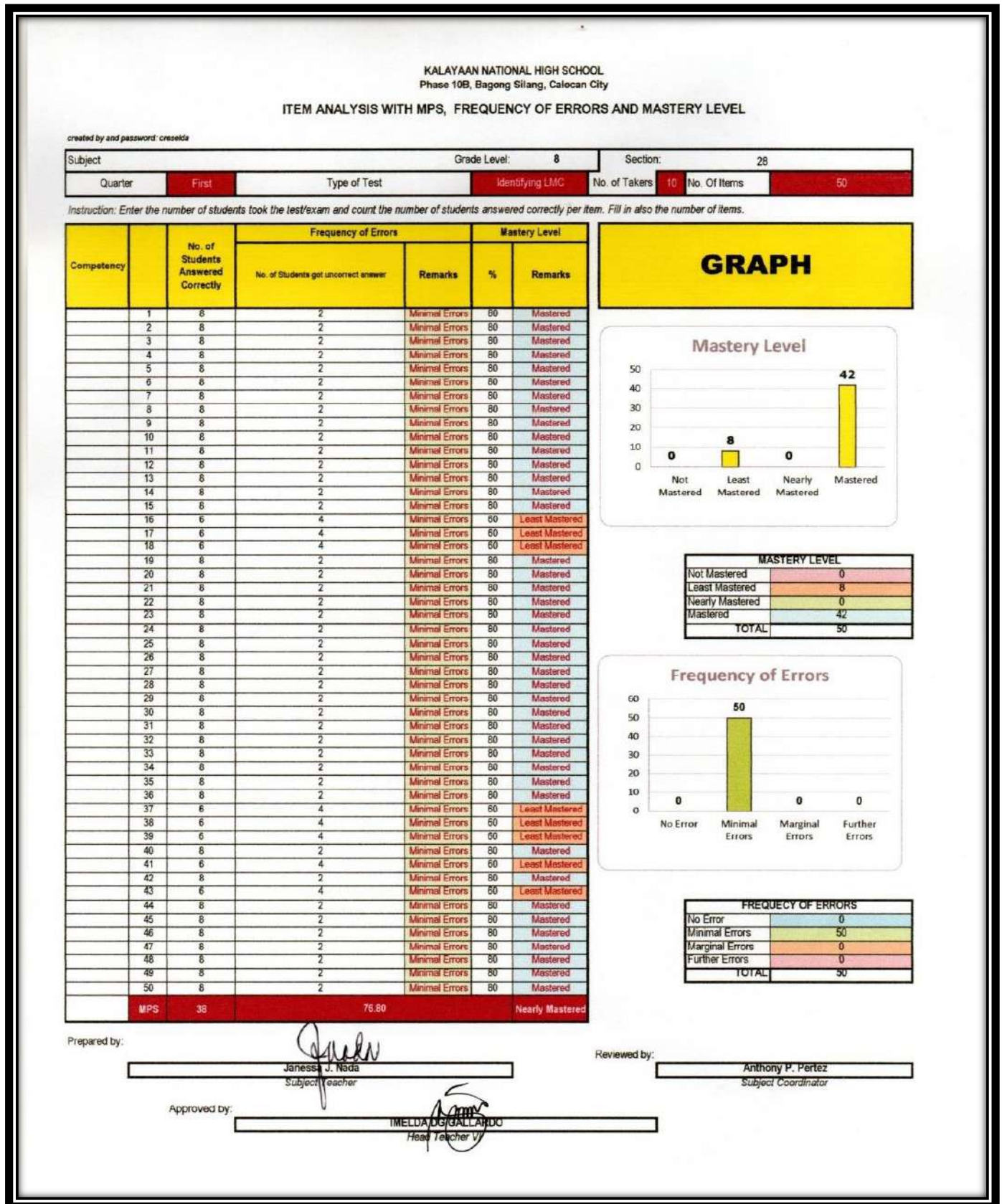


Fig 11 Item Analysis of Grade 8-28

• **Interpretation:**

The Least Mastered Competencies from Grade 8-6 shows Item No. 13, 14, 16 , 17, 18, 37, 38, 39, 41 and 43. With a total of eight (8) Least Mastered topics. These test questions pertaining to the following: Potential Energy, Kinetic Energy and Ohms Law. The Mean Per Score (MPS) is equivalent to 76.80, wherein the Mastery Level is Nearly Mastered.

From this, a pretest was done and recorded. The basis of crafted Learning Activity Sheet is based from 30 item test. After which the Learning Activity Sheet, as an intervention shall be given. Pilot Test 30 items test based on 50 items Test extracted LMC was conducted after.

After a series of teaching and learning process using the given intervention materials, students will have to answer the post-test, which is parallel to the pre-test. They will be checked by the teacher and shall be recorded. After that, the students will be answering the survey on difficulties encountered by the students in answering the Learning Activity Sheets. As vital as it can be, the researcher shall be analyzing all the data needed. From these data, the researcher will state the effectiveness of Learning Activity Sheets based on Least Mastered Competencies of Grade 8 Science.

➤ *Treatment of Data*

This study used true experimental research design. The Pre-test and Post-test information were evaluated using mean. The normalized gain score results were determined to get the difference between the Pre-Test and Post-Test.

In addition, T-Test of dependent variable mean was used to show if there is a significant difference between the pre-test and post-test data. Test analysis is set at 95% confidence level with a marginal error of 5%. This shall be used in understanding the significant difference of pretest and post-test scores.

This is used in getting the average of the pre-tests and post-tests of the respondents (Pritha, 2022)

In terms of *Survey of difficulties encountered by students in using the Learning Activity Sheets*, the research shall be using the Weighted Mean (sometimes known as the arithmetic mean) of a data collection is the sum of all values divided by the total number of values. It is the most often employed measure of central tendency and is frequently referred to as "the average."

CHAPTER THREE

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents, interprets and discusses the results of the gathered data about the Effectiveness of Learning Activity Sheets in the Least Mastered Competencies of Grade 8 in teaching Science at Caloocan during the School Year 2022-2023. The questions were raised to the respondents by following the sequence of specific questions in Chapter 1. The data were tabulated and analyzed using appropriate statistical tools as mentioned in Chapter 2. For precision and analysis, the data obtained from the respondents were categorized and presented in four (4) sections.

➤ *Sub-problem No.1. What is the result of the students score in terms of Pretest and Post-test?*

Table 2 Pre-Test Scores of the Grade 8 Students

Grade and Section	Mean	Mean Percentage Score	Rank
8-6	9.8	32.67	3
8-24	11.9	39.67	1
8-26	9.2	30.67	4
8-28	10.8	36.00	2
Composite Mean	10.3	34.33	

As gleaned from Table 2, Grade 8-24 registered the highest mean percentage score of 39.67 (rank1). This was followed by Grade 8-28 with the mean percentage score of 36.00. Grade 8-6 obtained a mean percentage score of 32.67 for a rank 3, followed by 8-26 with a mean percentage score of 30.67. It can be noted from the table that none of them got the passing score of 75 percent and above.

In the related literature, according to Alves (2020), based on studies on the academic underachievement of the Luso-Canadian population, the manifestations of an educational pandemic include high dropout rates, overrepresentation in special education and remedial reading programs, and exceptionally low rates of post-secondary education.

According to Maharani (2019), the implementation of the think-talk-write paradigm in conjunction with scientific literacy has a beneficial effect on the pupils of the eleventh grade at MIPA SMA Kartika 1-5 Padang's capacity for learning. According to the findings of a research that was carried out by De Jesus (2019), academic underachievement is defined as the inability of students to attain their maximum potential in relation to the subject matter of LMC. It is connected to the learner's lackluster performance in their academic work. According to the findings of a study that was carried out by Snyder and Anderson (2017), the concept of underachievement refers to the idea that an individual's achievements do not live up to their anticipated potential.

According to these data, the examination that the eighth-graders took was likely challenging. The majority of them got low results on the pre-test since some of them are not interested in the Science topic, and they have no concept what Potential Energy, Kinetic Energy, or Ohms Law are.

Table 3 Post-Test Scores of the Grade 8 Students

Grade and Section	Mean	Mean Percentage Score	Rank
8-6	24.2	80.67	2
8-24	25.5	85.00	1
8-26	22.4	74.67	4
8-28	23.3	77.67	3
Composite Mean	23.85	79.50	

Result of the Post-test revealed in Table 2. Grade 8-24 garnered the highest mean percentage score of 85.00 (rank1). This was followed by Grade 8-6 with a mean percentage score of 80.67. Grade 8-28 obtained a mean percentage score of 77.67 for a rank 3. Grade 8-26 rank 4 with a mean percentage score of 74.67.

In a related literature, Dwikoranto (2020) has designed a research with the intention of determining whether or not the student activity sheet model is helpful in encouraging scientific creativity, student learning outcomes, and student reactions to the learning process. The purpose of this study is to assess the efficacy of the model. The framework of the research was pre-experimental, one-group, pretest-posttest, and it was conducted using one participant pool. The student activity sheet (SAS) model and the applications of primary teacher Education students who created a scientific introduction concept course during Open University's 2019.1 registration were the key focuses of the research project. Data obtained employing tests and questionnaires with cognitive test instruments for goods, cognitive process tests, scientific creativity evaluations, and student questionnaire answers. The t-test was used to analyze the data, and proportions were calculated based on the results.

In a further study that Delos Reyes and Caballes carried out in 2021 on the contribution of Learning Activity Sheets to the enhancement of educational content, the researchers came to the conclusion that an education is necessary for each person because of the unique interests and obligations that come with being a citizen. The utilization of instructional materials is linked to the expansion of knowledge and technological capabilities, and it is coherent with the objectives of both the national education system and the overall educational mission. The content is communicated to the students by their teachers, and the students learn it via the completion of normal tasks in their daily lives. Learners demand interesting instructional materials as a tool for obtaining knowledge during the learning process; hence, unique learning materials are important to encourage learners to study.

According to the findings, the four sections that were chosen at random during Grade 8 at Kalayaan National High School fared very well on the Post –test. Because the Learning Activity Sheet in Science 8 boosts the students' intellectual capacity and encourages them to broaden their understanding of science, every single one of them was successful in meeting their targets on the Post-test and achieving the excellent marks they had set for themselves. This lends more credence to the idea that the Learning Activity Sheets utilized in Science 8 are successful.

Table 4 Summary of the Pre-Test and Post –Test of Mean Scores of the Grade 8 Students and their Learning Gains

Grade and Section	Pre-test Mean	Post-test Mean	Learning Gains
8-6	9.80	24.20	14.40
8-24	11.90	25.50	13.60
8-26	9.20	22.40	13.20
8-28	10.80	23.30	12.50
Composite Mean	10.30	23.85	13.55

Table 3 shows the summary of the result of the Pre-Test and Post-Test Mean Scores of the Grade 8 students and their learning gains. It can be seen that Grade 8-6 got the highest learning gain of 14.40, followed by the Grade 8-24 with a learning gain of 13.60. Grade 8-26 got a learning gain of 13.20. This was followed by Grade 8-28 with a learning gain of 12.50. The overall learning gains of four selected sections in Grade 8 was 13.55.

According to Monding and Buniel (2021), student worksheets are beneficial. The study tested worksheets for teaching science 9 topics. The study examines worksheet evaluation scores and adoption effects. When using worksheets, respondents' academic performance differs greatly. The research uses a teacher-made learning activity sheet based on Grade 8 science students' least-mastered skills from First Quarter Lessons. Science Masters Teachers validated. Responders now achieve more. Proven worksheets and conventional approaches have a large academic achievement disparity. The created worksheets are ideal for teaching Science 9 courses and greatly enhance students' efficiency. Many children did not study outside of school, and their academic performance in Science, Mathematics, and English Language was low (Monding & Buniel, 2021).

The four randomly selected Grade 8 sections of Kalayaan National High School performed well on the Post-test. Because Science 8's Learning Activity Sheet increases students' intellectual ability and pushes them to widen their science knowledge, every student met their Post-test goals and earned great scores. This supports Science 8's Learning Activity Sheets' success.

➤ *Sub-problem No.2: Is there a significant difference between the pre-test and the post-test score on the use of Learning Activity Sheets?*

Table 5 T-test Result of Pre-test and Post-test of the Grade 8 Students

Grade and Section	Pre-test Mean	Post-test Mean	T- test value	Degree of freedom	Critical value at 0.05	Interpretation	Decision
8-6	9.80	24.20	13.21	9	1.383	Significant	Reject Ho
8-24	11.90	25.50	13.51	9	1.383	Significant	Reject Ho
8-26	9.20	22.40	9.72	9	1.383	Significant	Reject Ho
8-28	10.80	23.30	7.38	9	1.383	Significant	Reject Ho

From Table 5 it can be seen that the computed mean differences in the Pre-Test mean scores and the Post-Test mean scores were found to be significant at 0.05 level after subjecting the mean scores to a T-Test. The computed T-values 13.21, 13.51, 9.72 and 7.38 respectively were found to be greater than the critical value of 1.383 at 0.05 significant level.

Before performing the t-test in the research of a similar kind carried out by Dwikoranto (2020), the normality test and the homogeneity test were carried out first. The amount of improved creativity as well as the results of student learning may be calculated using normalized N-Gain. 1) An improvement in the level of scientific originality exhibited by pupils after they have been exposed to the medium category of education. 2) Enhancing the learning outcomes of students as a direct result of their engagement in productive learning activities. 3) A favorable reaction on the part of the pupils to the teaching method. According to the data that has been provided in this article, it is possible to conclude that the use of the student activity sheet model in learning activities to improve scientific creativity competency and student learning outcomes has been effective.

In the similar light, according to Fauziah (2019), using worksheets that are focused on contextual teaching and learning might boost students' overall topic knowledge. According to the research carried out by Wiratman et al. in 2019, the outdoor learning activity sheet has a significant influence on the scientific method skills possessed by pupils. After using the outdoor learning activity sheet, there was a considerable increase not only in the overall results of the student's test of science process abilities but also in the overall quality of those results.

As a result, the hypothesis of no effect is not supported. This suggests that the mean scores of the respondents on the Post-test are considerably different from the mean scores they received on the Pre-test. The fact that these pupils from grade 8 performed so well with the assistance of the produced Learning Activity Sheets is further evidence that the sheets were effective.

➤ *Sub-problem No.3: What difficulties are encountered by the students upon using the Learning Activity Sheets?*

The Learning Activity Sheets were subjected to assessment. The respondents assess the difficulties they experienced upon using the Learning Activity sheets. The findings are revealed in Table 6.

Table 6 Respondents' Assessment on the Difficulties Experienced by Students in Using the Learning Activity Sheets

Indicators	Weighted Mean	Verbal interpretation
1.The content of each lesson in the learning activity sheets is difficult to understand.	2.18	Disagree
2. Each topic in the learning activity sheets is not fully discussed.	1.63	Strongly Disagree
3.The topics are not supported enough by illustrative examples.	1.65	Strongly Disagree
4. The language used is not clear and very interesting.	1.70	Strongly Disagree
5. The instructions are hard to follow.	2.00	Disagree
6. Explanations of the topic are confusing.	2.10	Disagree
7.There are many practice exercises for every lesson.	2.53	Agree
8. Printing of the learning activity sheets is not good quality.	1.55	Strongly Agree
9. The font size and font style of the learning activity sheets are not readable	1.58	Strongly Agree
10. The learning activity sheets are not durable.	2.05	Disagree

Legend: 1.00 - 1.75 Strongly Disagree (SD); 1.76 – 2.50 Disagree (D); 2.51 – 3.25 Agree (A); 3.26 – 4.00 Strongly Agree (SA)

Table 6 shows the respondents assessment on the difficulties experienced by students in using the learning activity sheets.

Specifically the indicators which are strongly disagreeable to the respondents are as follows: Each topic in the learning activity sheets is not fully discussed ($X=1.63$); the topics are not supported enough by illustrative examples ($X=1.65$); the language used is not clear and not interesting ($X= 1.70$); printing of the learning activity sheets is not good quality(1.55); and the font size and font style of the Learning Activity Sheets are not readable. The indicators which are disagreeable to the respondents are as follows: The content of each lesson in the Learning Activity Sheets is difficult to understand .($X=2.18$); the instructions are hard to follow ($X=2.00$); explanations of the topic are confusing (2.10) and The learning activity sheets are not durable (2.05). The indicator that is agreeable to the respondents is: There are many practice exercises for every lesson, this evidenced by the mean score of 2.53.

Looking at the same aspect of the study, Delos Reyes and Caballes (2021) found that the purpose of the study was to determine the thoughts and opinions of the students on the use of Learning Activity Sheets (LAS), to solicit suggestions for enhancements from colleagues and other Science teachers, and to evaluate the existing LAS. These goals were stated in the study that they conducted. Looking at the same aspect of the study. According to the findings, students viewed the LAS as being impartial, which suggests that it has the potential to act as a helpful instructional resource. It can imply that instructional materials have to be creative and interesting in order to capture the interest of pupils. In addition, one of the upgrades that the teachers mentioned was the inclusion of additional photos to the LAS. According to the findings of the study, while planning educational activities, it is vital to take into consideration how students assimilate new knowledge, develop new skills, and come up with new ways of thinking. In addition, educational activities need to be planned in a way that makes it easier to reach the goals set for the course and the overall program. The process of activity design entails the careful planning of various educational experiences in order to achieve these two objectives. Following a tried-and-true method of design is the first step in the process of developing effective and high-quality educational activities. Evaluating the learning outcomes both during and after each activity is necessary in order to guarantee that each activity supplied the needed degree of comprehension. In addition, the activity should be analyzed to establish the several ways

in which it might be improved for use in the future.

These findings affirm the high level of acceptance of the Learning Activity Sheet in Science 8. On the whole, the student respondents found the Learning Activity Sheets in Science 8 to be highly recommended and highly effective.

To ponder on this result deeper, Asio and Jimenez (2020) conduct an investigation of the effect that remedial activities have on the students' overall academic performance in the fifth-grade subject area of Science. The experimental design of the study consisted of a pre-test and a post-test. They chose two schools to conduct the experiment, and at each school, each class consisted of fifty kids. They chose one organization to serve as a control group and gave the other one the role of becoming the experimental group. In order to evaluate the students' overall academic performance, the researchers worked hand in hand with their respective science instructors. In the beginning, a pre-test was given to them during the first session of teaching that they had. As a result of the disappointing results obtained by both sets of schools, the researchers have suggested that the experimental group take corrective actions. They made it a point to urge the separate group to implement traditional pedagogical practices. After the intervention, the researcher did a second round of assessments based on the results of the second grading period to determine the overall effectiveness of the intervention. The researchers used a paired t-test to determine whether or not there were statistically significant differences in the scores of the two groups. According to the findings of the study, there was a discernible change in the students' performance on the exam after the intervention. As a result, the researchers arrived to the realization that remedial activities really have the potential to influence the academic performance of pupils.

These findings evidently manifest that the Learning Activity Sheets in Science 8 contribute to the enhancement of the skills and abilities of the students. It is also motivating the students to develop their interest and capabilities in Science. The students in Grade 8 appreciate the objectives, the contents, the evaluation and the language used in learning activity sheets. This learning materials in Science 8 is the answer for the needs of the students and teachers to facilitate teaching-learning process and to promote awareness that Science is not a difficult subject but it is an interesting one.

CHAPTER FOUR

SUMMARY, CONCLUSION AND RECOMMENDATION

In this chapter, the focus are the summary, conclusion and recommendation based on the result garnered from the data gathered. This answers the problem of the research.

➤ *Summary*

To summarize, students in grades 8 through 24 achieved the highest possible mean percentage score, which was 39.67 and ranked first. The next group had a mean percentage score of 36.00 and included students in grades 8 through 28. The mean percentage score for grades 8-6 was 32.67, placing them in third place, followed by grades 8-26, which had a score of 30.67 on the same scale. It is clear from the chart that none of them achieved the required passing mark of 75% or above. The post-test results showed that Grades 8-24 had the highest mean percentage score overall, which was 85.00 (rank 1). After it came Grades 8-6, which had a mean percentage score of 80.67. The average percentage score for grades 8 through 28 was 77.67, ranking them third. With a mean percentage score of 74.67, grades 8-26 come in at number four. Lastly, the pre-test and post-test mean scores of the students in grade 8 as well as their growth in knowledge are presented. It is clear that the Grade 8-6 received the biggest learning increase, with a score of 14.40, followed by the Grade 8-24, which received a score of 13.60. The learning increase for grades 8 through 26 was 13.20. After that came Grades 8 through 28, which had a total learning increase of 12.50. In all, students in four different 8th grade classes were able to acquire 13.55 points of new knowledge.

In terms of its significance, after applying a T-test to the mean scores, it is clear that the calculated mean differences between the Pre-Test mean scores and the Post-Test mean scores are significant at the 0.05 level. This can be seen in the following sentence. At the 0.05 level of significance, it was determined that the estimated T-values 13.21, 13.51, 9.72, and 7.38 were each higher than the critical value of 1.383.

The following is a summary of the evaluation that the respondents made regarding the challenges that students have while attempting to use the learning activity sheets. More precisely, the following is a list of the signs that the respondents find to be highly unsatisfactory: There is insufficient coverage of each topic in the learning activity sheets ($X=1.63$); the discussions of the topics are not adequately supported by sufficient illustrative examples ($X=1.65$); the language that is utilized is unclear and boring ($X = 1.70$), the printing quality of the learning activity sheets is poor (1.55), and the font size and style used on the Learning Activity Sheets are not legible. The following is a list of the indications that the respondents find to be unsatisfactory: It is challenging to comprehend the material presented in each of the lessons included in the Learning Activity Sheets ($X=2.18$); it is difficult to follow the directions ($X=2.00$); the explanations of the topic are unclear (2.10); and the learning activity sheets are not durable (2.05). There are numerous practice tasks for every session, which is indicated by the mean score of 2.53, which indicates that this is an indicator that is acceptable to the respondents.

➤ *Conclusion*

From the data gathered, the following conclusions are drawn:

- The post test results showed that the four sections of Grade 8 students at Kalayaan National High School that were selected at random performed exceptionally well. Because the Learning Activity Sheet in Science 8 improves the students' intellectual capacity and helps them to widen their understanding of science, each and every one of them was successful in meeting their objectives on the Post-test and attaining the high marks they had set for themselves. This is because the Learning Activity Sheet in Science 8 promotes them to broaden their understanding of science. This provides more support for the hypothesis that the Learning Activity Sheets that are implemented in Science 8 are effective.
- As a direct consequence of this, the premise that the study rejected the Null Hypothesis for there was a significant difference. It would appear from this that the respondents' mean scores on the Post-test are significantly different from the mean scores they earned on the Pre-test. The fact that these students from grade 8 did so well with the help of the created Learning Activity Sheets is another indication that the sheets were successful.
- These data make it abundantly clear that the Learning Activity Sheets included in Science 8 help students improve their skills and capabilities, which is one of the objectives of the course. Additionally, it inspires the kids to cultivate their interest in science as well as their ability in the subject. The objectives, the contents, the evaluation, and the language that are utilized in the learning activity sheets are all appreciated by the students in Grade 8. This learning materials in Science 8 is the response for the demands of the students and teachers to facilitate the teaching-learning process and to raise awareness that Science is not a tough topic, but rather that it is an engaging one.

➤ *Recommendations*

With the results of the study, the following are the recommendations of the study:

- The Department of Education, the Science Department, and the instructors should keep utilizing the Learning Activity Sheets as a means of determining the level of knowledge that the students have received with regard to the Least Mastered Competencies. The findings demonstrate that the strategy was successful. In other words, the employment of learning Activity Sheets as extra material may be useful and effective.
- It is recommended that curriculum innovators incorporate the usage of learning activity sheets into collaborative disciplines in order to alleviate some of the load associated with completing a large number of activity sheets.
- It is recommended that next scholars investigate the efficacy of Learning Activity Sheets across a variety of fields. In this way, it can assess the efficacy of Learning Activity Sheets in different subjects to help the teachers and students.
- It is also recommended by the researcher to use identify the efficacy of Learning Activity Sheets in different year level, whether higher or lower. In this sense, teachers can craft helpful learning resources.
- In addition to this, potential solutions to the issues discovered in the research will be made available so that future researchers can use them. Therefore, it has the potential to improve the usage of Learning Activity Sheets not only in the field of Science, but also in a variety of other fields.

REFERENCES

- [1]. Legal News and Analysis, Jenny Ann A. Pimentel-Tibon, 2020 Section 1, Article XIV of the 1987 Constitution Section 6, Chapter 1 of Republic Act No. 9155, or *the Governance of Basic Education Act of 2001*
- [2]. School Testing Center/ Science Department Files – Kalayaan National High school
- [3]. Albuquerque Public Schools. (2020). Provisions of Remediation/Intervention Action. Retrieved from Albuquerque Public Schools: <https://www.aps.edu/about-us/policies-and-procedural-directives/procedural-directives/i.-instruction/remediation-of-student-learning>
- [4]. Alchemer. (2021). What is Purposive Sampling? Retrieved from Alchemer: <https://www.alchemer.com/resources/blog/purposive-sampling-101/#:~:text=What%20is%20Purposive%20Sampling%3F,to%20participate%20in%20their%20surveys.>
- [5]. Alves, C. (2020). Educational epidemic: A study of the academic underachievement of luso-canadians. *Inquiry@Queen's Undergraduate Research Conference Proceedings*. <https://doi.org/10.24908/iquurcp.14063>
- [6]. Asio, J., & Jimenez, E. (2020). Effect of Remediation Activities on Grade 5 Pupils' Academic Performance in Science. *Modestum*, 64-84.
- [7]. Baherimoghadam, T. (2021). The effect of learning style and general self-efficacy on satisfaction of e-Learning in dental students. *BMC Medical Education*, 31-40.
- [8]. Bhandari, P. (2022, July 15). What Is Quantitative Research? | Definition, Uses and Methods. Retrieved from Scribbr: <https://www.scribbr.com/methodology/quantitative-research/>
- [9]. Cantonjos, J., & Janer, S. (2022). Effectiveness of Utilizing Learning Activity Sheets to Improve the Solving Skills involving Sampling Distribution of Grade 11 Students. *United International Journal for Research & Technology*, 53-60.
- [10]. Cortland. (2017). Learning styles. Retrieved from Cortland: <https://web.cortland.edu/andersmd/learning/introduction.htm#:~:text=Learning%20style%20can%20also%20be,and%20how%20the%20two%20interact.>
- [11]. F. Delos Reyes, F. J., & Caballes, D. G. (2021). A review on the school – based learning activity sheet towards improvement of instructional material. *International Journal of Scientific and Research Publications (IJSRP)*, 11(8), 200–204. <https://doi.org/10.29322/IJSRP.11.08.2021.p11627>
- [12]. Niogan Elementary School, Department of Education, Philippines, & De Lara, K. A. (2017). *Contextualization and localization: Acceptability of the developed activity sheets in science 5 integrating climate change adaptation*. 20–24. <https://doi.org/10.17501/iccc.2017.1103>
- [13]. M. Siahaan, M. Sirait, (2017) . “Development of Student Activity Sheet (Worksheet) Based on Guided Inquiry to Improve Student’s Critical Thinking Skills in Senior High School”. *Journal of Education and Practice*, Volume 8, Number 20. ISSN: 2222 – 288X Fauziah, T. Nurita, (2019). “Activities of Students in Using Worksheet Based on Contextual Teaching and Learning”. *IOP Publishing, Journal of Physics: Conference Series*. 1417 012088 Igiri, (2015). “Impact of Instructional Materials in Teaching and Learning of Biology in Senior Secondary Schools in Yakurr LG A.”. *International Letters of Social and Humanistic Sciences*, Volume 62, pp. 27 – 33. ISSN: 2300 – 2697
- [14]. Amila, A. Abdurrahman, D. Wayan, H. Kartini, (2018). Practicality and Effectiveness of Student Worksheets Based on Ethno Science to Improve Conceptual Understanding in Rigid Body”, *International Journal of Advanced Engineering, Management and Science*, Volume 4, Issue 5. ISSN: 2454 – 1311
- [15]. Department of Education. (2020). *Learning Opportunities Shall be Available*. Philippines: Quezon City: Department of Education.
- [16]. Department of Education. (2020). *Learning Opportunities Shall be Available*. Philippines: Department of Education.
- [17]. Edutopia. (2007, November 5). *Technology Integration*. Retrieved from Edutopia: <https://www.edutopia.org/technology-integration-guide-description>
- [18]. Edmentum. (2021, June 24). Acceleration vs. Remediation vs. Intervention: What’s the Difference? Retrieved from Edmentum: <https://blog.edmentum.com/acceleration-vs-remediation-vs-intervention-whats-difference>
- [19]. DepEd Order No. 18 Series 2020 “Policy Guidelines on the Provision of Learning Resources in the Implementation of the Basic Education Learning Continuity Plan”. Department of Education.
- [20]. DepEd Order No. 12 Series 2020 “Adoption of the Basic Education Learning Continuity Plan for School Year 2020 – 2021 in light of the Covid – 19 Public Health Emergency”. Department of Education. https://www.deped.gov.ph/wpcontent/uploads/2020/06/DO_s2020_012.pd
- [21]. Department Order no. 08 s 2015. Policy Guidelines on Classroom Assessment.
- [22]. Division Memorandum (DM) No. 89 s. 2020, Clarification on the use of the Most Essential Learning Competencies (MELCs)
- [23]. Division Memorandum (DM) No. 405, s. 2021, “Utilization of Learning Activity Sheets and Flexible Learning Delivery Plan (FLDP)
- [24]. Division Memorandum (DM) No.212 s. 2021, “Refinement/ Revalidation of Self-Learning Module (SLMs) and Learning Activity Sheets (LAS).
- [25]. Dwikoranto, R. (2020). The effectiveness of the students activity sheet (SAS) on teaching-learning and creativity (TLC) model to increase creativity competence. *Studies in Learning and Teaching*, 175-184.
- [26]. Gillies, D. (2008). Educational potential, underachievement, and cultural pluralism. *Education in the North*, 16, 23-32.

- [27]. Harnoto, B. T. (2020). The effectiveness of the student activity sheet (Sas) on teaching-learning and creativity (Tlc) model to increase creativity competence. *Studies in Learning and Teaching*, 1(3), 175–184. <https://doi.org/10.46627/silet.v1i3>.
- [28]. Iris Center. (2017). Self-Monitoring. Retrieved from Iris Center: <https://iris.peabody.vanderbilt.edu/module/sr/cresource/q2/p04/#:~:text=Self%2Dmonitoring%20is%20a%20strategy,or%20duration%20of%20existing%20behavior>.
- [29]. Jato, M. (2019). Study habits, use of school libraries and students' academic performance in selected secondary schools in Ondo West Local Government Area of Ondo State. *International Journal of Library and Information Science*, 228-240.
- [30]. Jenkins, H. (2023, January 8). Remediation and Intervention for Math and Literacy Using Hands-On Learning. Retrieved from Hand 2 Mind: <https://www.hand2mind.com/blog/remediation-intervention-using-hands-on-learning#:~:text=The%20goal%20of%20both%20remediation,skill%20or%20concept%20is%20completed>.
- [31]. Llego, M. (2020). Reproduction of Learning Activity Sheets for Multigrade Schools. Retrieved from TeacherPH: <https://www.teacherph.com/reproduction-learning-activity-sheets-multigrade-schools/>
- [32]. McCombs, S. (2022, May 5). Descriptive Research Design | Definition, Methods & Examples. Retrieved from Scribbr: <https://www.scribbr.com/methodology/descriptive-research/>
- [33]. Monding, V., & Buniel, J. (2021). Effectiveness of developed worksheets to the academic achievement of students in Science 9 concepts. *International Journal of Innovation Education and Research*, 11-33.
- [34]. M. Ningrum, Yulkifli, R. Abdullah, Y. Nasution, (2019). “Preliminary Study in the Student Worksheet Development Using Inquiry Based Learning Model in Science Process Skills Approach for Physics Learning of Second Grade High School. IOP Publishing, *Journal of Physics*. 1317 012163
- [35]. Monding, V, Buniel J. (2021), Effectiveness of Developed Worksheets to the Academic Achievement of Students in Science 9. *International Journal for Innovation Education and Research*, ISSN 2411- 2933
- [36]. National Library of Medicine. (2020). Standard Deviation. Retrieved from National Library of Medicine: [https://www.nlm.nih.gov/nichsr/stats_tutorial/section2/mod8_sd.html#:~:text=A%20standard%20deviation%20\(or%20%C2%83,data%20are%20more%20spread%20out](https://www.nlm.nih.gov/nichsr/stats_tutorial/section2/mod8_sd.html#:~:text=A%20standard%20deviation%20(or%20%C2%83,data%20are%20more%20spread%20out).
- [37]. R. De Jesus (2021) Improving the Least Mastered Competencies in Science 9 Using “Pump It Up!” Electronic Strategic Intervention Material. Presented at the DLSU Research Congress 2019 De La Salle University, Manila, Philippines June 19 to 21, 2019
- [38]. Rappler. (2021, March 31). *COVID-19 pandemic: Latest situation in the Philippines – March 2021*. Retrieved from Rappler: <https://www.rappler.com/nation/covid-19-pandemic-latest-situation-in-the-philippines-march-2021>
- [39]. Rose, C. (2016). What Is Self-Monitoring for Behavior and Learning? Retrieved from Study: <https://study.com/academy/lesson/what-is-self-monitoring-in-the-classroom.html>
- [40]. Sambayon, H. (2020). Utilization of Contextualized Teacher-Made Activity Sheets in Teaching Mathematics 5 Learners and Their Academic Performance. *Research Gate*, 50-62.
- [41]. Snyder, K. E., & Adelson, J. L. (2017a). The development and validation of the perceived academic underachievement scale. *The Journal of Experimental Education*, 85(4), 614–628. <https://doi.org/10.1080/00220973.2016.1268087>
- [42]. Toman, A. Akdeniz, S. Cimer, F. Gurbuz (2013) .“ Extended Worksheet Developed According to 5E Model Based on Constructivist Learning Approach”, . *International Journal on New Trends in Education and Their Implication*, Volume 4, Article 16. ISSN: 1309 – 6249
- [43]. Touch Math 123. (2022). Effective Intervention and Remediation Must be Personalized. Retrieved from Touch Math 123: <https://www.touchmath.com/effective-intervention-and-remediation-must-be-personalized/>
- [44]. U. Johan, L.Kasmini, W. Subroto (2019).“ The Development Of Student Activity Sheets Integrated With Scientific Approach To Increase Students’ Skills In Completing Natural Environment” *Journal of Scientific & Technology Research*, Volume 8, Issue 08, ISSN 2277-8616 508 IJSTR©2019 www.ijstr.org
- [45]. Voxco. (2021, October 1). True Experimental Design. Retrieved from Voxco: <https://www.voxco.com/blog/true-experimental-design#:~:text=True%20experimental%20design%20is%20a,support%20the%20existence%20of%20relationships>.

APPENDIX A LETTER TO VALIDATORS

➤ *To whom it may concern,*

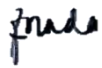
The undersigned is currently working on a study entitled “*Effectiveness of Learning Activity Sheets in the Least Mastered Competencies in Grade 8 Science*”. In this regard, I am requesting you to kindly validate the attached questionnaires for they will use it as an instrument in determining the factors that affect students’ intervention using Learning Activity Sheets to Least Mastered Competencies in Science 8. The instrument will serve as one of the bases for crafting the effectiveness of the said intervention.

The following are the list of research instruments:

1. 50 Items Test in Science 8 to determine the Least Mastered Competencies of the Students
2. 30 Items Test in Science 8 to determine the Effectiveness of Learning Activity Sheets
3. Learning Activity Sheets
4. Survey Questionnaire – Difficulties experienced by students in Using the Learning Activity Sheets

Your help is highly appreciated. Thank you very much.

Yours truly,



Janessa J. Nada
Researcher

Noted by:

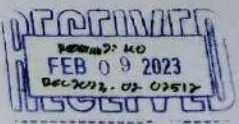


DAGAME O. BOHOL Ph. D.
Professor, Graduate School of Teacher Education

APPENDIX B

LETTER TO CONDUCT STUDY

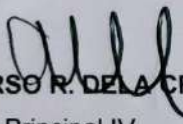

Republic of the Philippines
Department of Education
National Capital Region
Schools Division Office of Caloocan City
Kalayaan National High School
Phase 10 B Brgy. 176-Bagong Silang, Caloocan City



From the office of the Principal

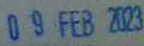
1st Endorsement
February 8, 2023

Respectfully forwarded to **DR. NERISSA L. LOSARIA, CESO V**, Schools Division Superintendent, Schools Division Office, Caloocan City, the herein basic communication of **MRS. JANESEA J. NADA**, Teacher II in this school, requesting permission to administer Test in Science 8, Learning Activity Sheets and Survey Questionnaire in, Kalayaan National High School relative to the partial fulfillment of her study in Master of Arts in Education with a major in Science Education at The National Teachers College(NTC), recommending for perusal and approval.


MR. TIRSO R. DELA CRUZ
Principal IV

Attached: As Stated


Address: Phase 10 B Bagong Silang, Caloocan City
Telephone No.: (+63 2) 3660600
Email Address: lnhssecondary@yahoo.com



APPENDIX C

PERMIT TO CONDUCT STUDY



Republic of the Philippines
Department of Education
 NATIONAL CAPITAL REGION
 SCHOOLS DIVISION OFFICE OF CALOOCAN CITY

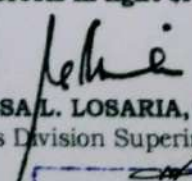
Office of the Schools Division Superintendent

2nd Endorsement
February 10, 2023

Respectfully returned to Mr. Tirso R. Dela Cruz, Principal IV, Kalayaan National High School, approving the herein request of **Ms. Janessa J. Nada**, Teacher II, to administer questionnaires relative to her thesis entitled **"Effectiveness of Learning Activity Sheets in the Least Mastered Competencies in Grade 8 Science"** subject to the following conditions:

- Necessary arrangements shall be made with the school head/s concerned;
- Researcher must present to the local school authorities and bear a copy of this endorsement prior to any engagement with the school/s;
- The conduct of study will not interfere with the regular program of the school;
- No teacher nor student will be pulled out of his/her classes;
- Respondents shall be treated with respect and be addressed in a kind manner in accordance with the ethical standards set by DepEd Order No. 16, series of 2017 re: Research Management Guidelines;
- No government fund or school/office material will be used for the purpose of the study;
- Data gathered shall be treated with utmost confidentiality and should be used solely for research purposes; and
- A copy of the findings of the study shall be furnished this Office for reference.

Further, it is reminded that the Schools Division Office adheres to the Department of Education's strict implementation and compliance to the provisions stipulated in DepEd Order No. 9, s. 2005 titled: **Instituting Measures to Increase Engaged Time on Task and Ensuring Compliance Therewith** and DepEd Order No. 39, s. 2022 titled **Health and Safety Protocols in light of the Covid-19 Pandemic** and DepEd Order No. 48, s. 2022 titled **Implementing Executive Order No. 07, s. 2022 and Amending DepEd Order No. 039, s. 2022 (Health and Safety Protocols in light of the Covid-19 Pandemic)**.


NERISSA L. LOSARIA, CESO V
 Schools Division Superintendent

RECEIVED - SDO CALOOCAN
 RECORDS SECTION
RELEASED
 By:  Date: 02/13/23
 Time: 9:00 AM

Request to Conduct Study_Nada, Janessa J.
 /February 10, 2023

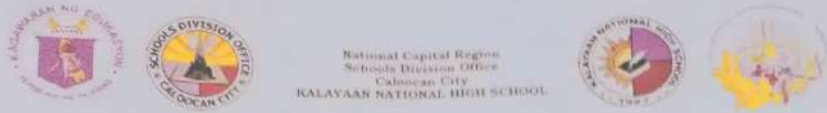
16021-02-048



Address: 10th Avenue cor. P. Sevilla St., Grace Park, Caloocan City
 Telephone No.: (+63 2) 8-442-0029; 8-361-1463
 Email Address: caloocan.city@deped.gov.ph
 Website: deped.in/depedcaloocan

APPENDIX D

PARENT CONSENT FORM



PARENT CONSENT FORM

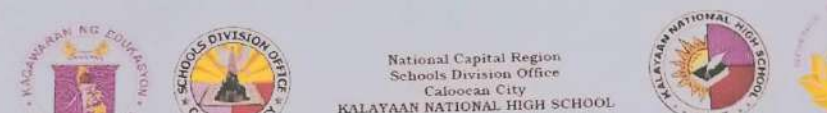
This is to allow my son/daughter _____ of Grade 8 Section _____ to voluntarily take part in the research study entitled “ **Effectiveness of Learning Activity Sheets in the Least Mastered Competencies of Grade 8 Science** ”

I, thus, fully commit all the needed information for the purpose of research study based from Privacy Act 2020.

Parent/Guardian
Signature over printed name

Prepared by: *JNADA*
JANESSA J. NADA
Researcher

Noted by: *MR. TIRSO R. DELA CRUZ*
Principal IV



PARENT CONSENT FORM

This is to allow my son/daughter _____ of Grade 8 Section _____ to voluntarily take part in the research study entitled “ **Effectiveness of Learning Activity Sheets in the Least Mastered Competencies of Grade 8 Science** ”

I thus fully commit all the needed information for the purpose of research study based from Privacy Act 2020.

Parent/Guardian
Signature over printed name

Prepared by: *JNADA*
JANESSA J. NADA
Researcher

Noted by: *MR. TIRSO R. DELA CRUZ*
Principal IV

APPENDIX E LETTER TO RESPONDENTS



National Teachers College

Graduate Program, School of Teacher Education

Dear Respondents,

The undersigned is a Graduate School student of Masters in Education, Major in Science Education at National Teachers College undertaking a research entitled "*Effectiveness of Learning Activity Sheets in the Least Mastered Competencies of Grade 8 Science*". In this regard, I am requesting you to answer the questionnaires for it will be used as an instrument in determining the effectiveness of Learning Activity Sheets in the Least Mastered Competencies of Grade 8 Science. The instrument will serve as the basis to answer the research questions of the study.

Rest assured that your responses to this questionnaire will be treated with high confidentiality

Your help is highly appreciated. Thank you very much.

Yours truly,

Janessa J. Nada
Researcher

Noted by:

PROF. DAGAME O. BOHOL
Thesis Adviser

APPENDIX F TABLE OF SPECIFICATION

50 Item Test in Science 8

1	CID-M&E Form 12	Republic of the Philippines						
2		Department of Education						
3		NATIONAL CAPITAL REGION						
4		CALOOCAN CITY						
5		KALAYAAN NATIONAL HIGH SCHOOL						
6								
7	TABLE OF SPECIFICATION							
8	School:	KALAYAAN NATIONAL HIGH SCHOOL	Grade: 8 SCIENCE 8					
9	District:	CND II	Quarter: 1ST					
10	Department Head:	IMELDA DG GALLARDO	School: 305382					
11	Learning Competencies							
12		COGNITIVE PROCESS DIMENSION						
13	The learners should be able to...	Duration (Hours)	Understanding	Applying	Analyzing	Evaluating	Creating	Test Item Placement
14	1 Investigate the relationship between the amount of force applied and the mass of the object to the amount of change in the object's motion (S8FE-1a15)	6	2 (1,3)	1(4)	2(8,12)	1(11)		1,3,4,8,11,12
15	2 Infer that when a body exerts a force on another, an equal amount of force is exerted back on it (S8FE-1a16)	6	1(2)	2(6,10)	1(9)	2(5,7)		2,5,6,7,9,10
16	3 Identify and explain the factors that affect potential and kinetic energy (S8FE-1d-22)	6	1(13)	1(18)	2(15,17)	2(14,16)		13-18
17	4 Investigates the effect of temperature to the speed of sound (S8FE-1e-25)	5	1(22)	3(20,21,23)	1(19)			19-23
18	5 Explain the hierarchy of colors in relation to the energy of visible light (S8FE-1l-27)	7	1(25,26,27,1)	1(25)	2(24,28,30)			24-30
19	6 Differentiate between heat and temperature at the molecular level (S8FE-1g-29)	6	2(31,35)		3(33,34,36)		1(32)	31-36
20	7 Infer the relationship between current and voltage (S8FE-1h-30)	7	2(40,37)	2(38,39)	1(42)	2(41,43)		37-43
21	8 Explain the advantages and disadvantages of series and parallel connections in home (S8FE-1i-31)	4	2(44,47)		1(45)		1(46)	44-47
22	9 Explain the functions of circuit breakers, fuses, earthing, double insulation, and other safety	3	1(48)	1(50)	1(49)			48-50
23	TOTAL	50	12	11	14	11	2	
24								
25	Prepared by:			Date:	February 8, 2023			
26		JANESSA J. NADA						
27		Teacher						
28								
29								

APPENDIX G

TEST IN SCIENCE 8

Identifying Least Mastered Competencies in Science 8

Department of Education

NATIONAL CAPITAL REGION

CALOOCAN CITY

KALAYAAN NATIONAL HIGH SCHOOL

TEST IN SCIENCE 8

Name: _____

Grade and Section: _____

MULTIPLE CHOICE

Direction: Write the letter of the correct answer.

1. Which law states that a body at rest will remain at rest and a body?

- A. Law of Acceleration
- B. Law of Gravitation
- C. Law of Inertia
- D. Law of Interaction

2. Which of the following scientists proposed the three laws describing how objects move?

- A. Copernicus
- B. Einstein
- C. Kepler
- D. Newton

3. Why is a more massive object difficult to move from rest, slow down, speed up or change its direction?

- A. Because of time
- B. Because of friction
- C. Because of its weight
- D. Because it has more inertia

4. Lifting a bottle of water is easy. But lifting a drum of water is not. How is mass of an object related to inertia?

- A. The more massive object has more inertia.
- B. The more massive object has less inertia.
- C. The less massive object has more inertia.
- D. The mass of object has no relation to inertia.

5. What is the acceleration of a 12 kg cart if a net force of 144 N is applied on it?

- A. 10 m/s²
- B. 12 m/s²
- C. 14 m/s²
- D. 24 m/s²

6. Which of the following pictures BEST explains Law of Inertia?

Photo credit:

7. Which mass of an object is more difficult to accelerate?

- A. 6kg
- B. 12kg
- C. 20kg
- D. 30kg

8. According to the Law of Inertia, what will happen to a person in a stationary jeep when it suddenly moves forward

- A. The person will stay at rest
- B. The person will move forward
- C. The person will be fall on his seat
- D. The person will be thrown forward

9. What does Law of Interaction state?

- A. In some interaction, the amount of momentum remains constant
- B. The acceleration of an object is dependent upon the net force acting
- C. If a body is at rest or moving at a constant speed in a straight line, it will remain at rest or keep moving in a straight line at constant speed
- D. If a body exerts a force on a second body, the second body exerts a force that is equal in magnitude and opposite in direction to the first force

10. A volleyball player exerts a force of 60 N in kicking the ball. How much force in return does the ball exert on the player?

- A. 0 N
- B. 25 N
- C. 60 N
- D. 100 N

11. A person on a skateboard pushes off the ground with their foot. This caused them to accelerate at a rate of 5 m/s². If the person weighs 550 N with respect to gravity, how strong were they pushed off the ground?

- A. 56 N
- B. 281 N
- C. 445 N
- D. 550 N

12. According to the Law of Acceleration, what will happen to the acceleration of the tricycle and jeep if a constant force is applied to both?

- A. Both tricycle and jeep will not move
- B. The tricycle will move faster than the jeep
- C. The jeep will move faster than the tricycle
- D. The tricycle and jeep will move with the same acceleration

13. Which of the following refers to an energy of a moving object?

- A. Kinetic Energy
- B. Potential Energy
- C. Chemical Energy
- D. Thermal Energy

14. What is the kinetic energy of a 1500-kg jeep if it is moving with 30m/s velocity?

- A. 22, 500 J
- B. 45,000 J
- C. 675,000 J
- D. 1, 350,000 J

15. What are the energy transformations that happen when you switch on a light bulb?

- A. light energy to thermal energy to electrical energy to thermal energy
- B. electrical energy to thermal energy to light energy to thermal energy
- C. electrical energy to thermal energy to light energy to mechanical energy
- D. chemical energy to thermal energy to electrical energy to chemical energy

16. How much is the gravitational potential energy of a 3-kg cabinet being lifted 10 m from the floor? Use $g=9.8\text{m/s}^2$

- A. 120 J
- B. 130 J
- C. 150 J
- D. 294 J

17. Which of the statements below BEST demonstrates potential energy?

- A. A man running at 5m/s
- B. A fruit falling from a tree
- C. Six gymnasts pull a tumble mat
- D. A girl lying on her bed 0.5 meter above the ground

18. Based on the position of a cart on diagram below, at which point is potential energy greatest?

- a. W
- b. X
- c. Y
- d. Z

19. What will happen to the sound waves as the temperature of a medium increases?

- A. It will go faster
- B. It will be slower
- C. as the same speed
- D. as the same direction

20. Why is the school library covered with carpet?

- A. Because it looks good
- B. So everyone can make a lot of noise
- C. To help absorb sounds to keep it quiet
- D. To help absorb sounds so it can stay

21. Why does sound travel faster in solids than in liquids or gases?

- A. Solids are harder
- B. Solids have more energy
- C. Gases fill their container
- D. The particles are closer together

22. What factor/s the speed of a sound wave depend/s on?

- A. The medium
- A. The frequency
- C. the air temperature
- D. Both air and temperature

23. Which of the following is the speed of sound in air at 20 degrees Celsius?

- A. 331m/s
- C. 621 m/s
- B. 343 m/s
- D. 621 m/s

24. If a material absorbs all frequencies of light waves EXCEPT green, what color will be perceived by the observer?

- A. black
- B. green
- C. white
- D. yellow

25. What is the similarity between red and violet light?

- A. frequency
- C. speed
- B. period
- D. wavelength

26. What determines the color of light?

- A. amplitude
- C. period
- B. frequency
- D. speed

27. Which of the following colors of light has the longest wavelength?

- A. green
- B. orange
- C. red
- D. violet

28. Which of the following statements is CORRECT about the visible light spectrum?

- A. The longer the wavelength the higher the frequency
- B. The shorter the wavelength the higher the energy
- C. The higher the frequency the lower the energy
- D. The longer the wavelength the lower the frequency and energy

29. Which has the greatest energy among the colors in a rainbow?

- A. green
- B. orange
- C. red
- D. violet

30. A student placed a pencil in a cup of water. The pencil appears broken because light



Photo credit to the writer

- A. always travel in a straight line
- B. bends when it passes through water**
- C. makes the water in the glass evaporate
- D. reflects the pencil on the water's surface

31. What is a device that is used to measure temperature?

- A. barometer
- B. respirator
- C. stethoscope
- D. thermometer**

32. How would you elaborate on the reason why an exhaust fan is often placed on elevated parts of the wall of a room?

- A. For aesthetic reason
- B. To keep it out of children
- C. Because hot air goes upward**
- D. Because cold air passes thru the fan and on to the room

33. Which of the following is NOT TRUE when a hot object is brought into contact with cold object?

- A. They will never have the same temperature**
- B. The cold objects absorb the heat from the hot object
- C. There is a continuous flow of heat from hot to cold objects
- D. Thermal equilibrium will be attained after sometime

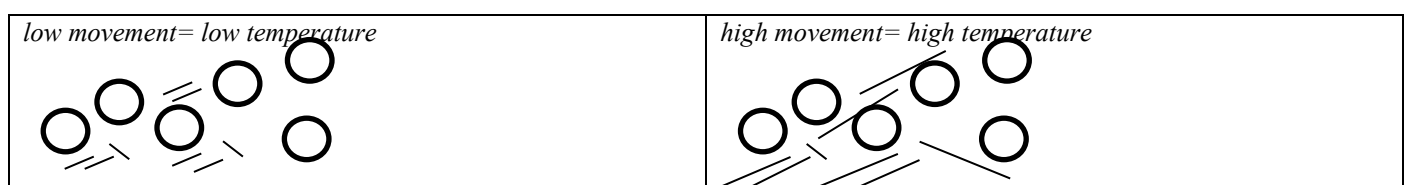
34. Which of the following statements below is/are MISCONCEPTIONS on heat and temperature?

- A. Heat and temperature are one and the same**
- B. Heat energy that flows to or from a substance
- C. The unit of temperature is Celsius while heat is calorie
- D. Temperature is the measure of hotness or coldness of a body while heat is the kinetic energy absorbed by the body

35. What is the natural flow of heat?

- A. Cannot be determine
- B. From different directions
- C. From cold body to hot body
- D. From hot body to cold body**

36. Based from the illustration, what is the relationship of movement of molecules to the temperature of an object?



Illustrated by the writer

- A. The faster the molecules move, the hotter an object is.**
- B. The slower the molecules move, the hotter an object is.
- C. The faster the molecules move, the colder an object is.
- D. The faster the molecules move, the object remain the same

37. Which of the following refers to the potential difference or electromotive force?

- A. charge
B. Current
C. Resistance
D. Voltage

38. What will happen to the current if the resistance increases?

- A. it decreases
B. it increases
C. stay the same
D. cannot be determined

39. An 18-volt source needs to power a 3-A bulb, what would be the suitable wire resistance for the circuit?

- A. 0.17 Ω wire
B. 3 Ω wire
C. 6 Ω wire
D. 54 Ω wire

40. Which is used to describe a closed, continuous path through which electrons can flow?

- A. Circuit
B. Charge
C. Voltage
D. Resistor

41. How much voltage is needed to run a 10-A of current through a 4.5- Ω resistor?

- A. 0.45V
B. 2.22V
C. 22.2V
D. 45V

42. Which of the following BEST describes the relationship between current and resistance?

- A. Resistance do not directly affect the current
B. The higher the resistance, the lower the current
C. The higher the current, the higher the resistance
D. The higher the voltage, the lower the resistance

43. How much current flows through a lamp with a resistance of 40 Ω , when it is connected to a 110-V outlet?

- A. 0.275A
B. 2.75A
C. 27.5A
D. 275A

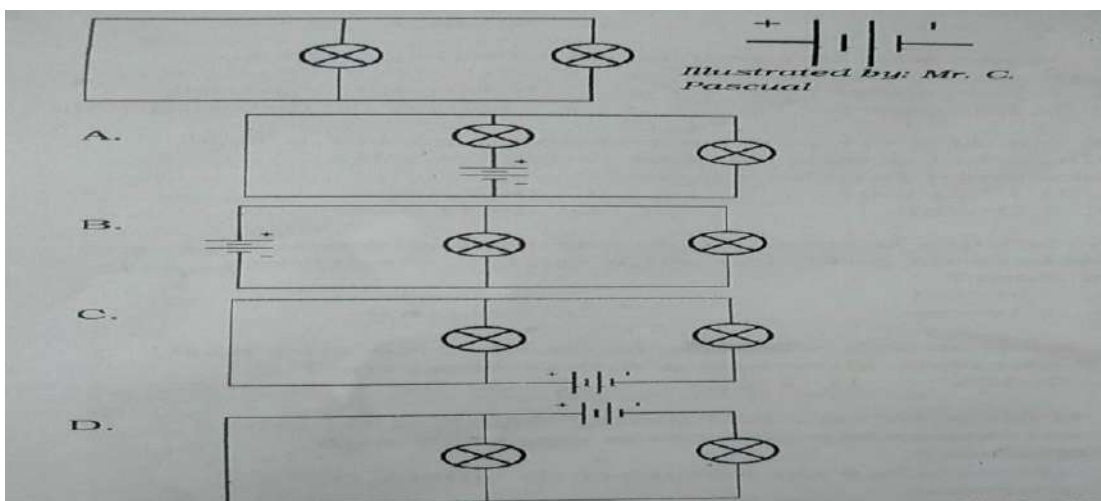
44. Which of the following BEST describes a parallel circuit?

- A. Circuits have two or more loads
B. Has two or more loads but flows through a single conducting path
C. Has more than one path for current to flow
D. None of the above

45. This circuit has more than one loop. When one light goes out, the others stay on. What kind of circuit is being described?

- A. closed circuit
B. parallel circuit
C. series circuit
D. open circuit

46. If you will create a diagram showing a parallel connection, where should you place the source?



47. Three bulbs are connected in parallel, if one bulb goes out, what will happen to the remaining bulbs?

- A. blows up
B. heats up
C. stays on
D. also turns off

48. What safety device consist of a high resistance strip of alloy that melts readily?

- A. fuse
- B. grounding
- C. circuit breaker
- D. earth wire

49. How does the circuit breaker work?

- A. it changes the voltage rating
- B. makes the electric current flow
- C. interrupts the flow of electric current
- D. divides the power used in appliance

50. Why is it practical to install multiple breakers instead of a single fuse?

- A. Because multiple breakers protect us from grounding.
- B. Because multiple breakers protect us from short circuits
- C. Because multiple breakers protect us from electrocution
- D. Because multiple breakers protect us from circuit overload.

APPENDIX H

Table of Specification for Test in Science 8

CID – M&E Form 12		Republic of the Philippines Department of Education NATIONAL CAPITAL REGION CALOOCAN CITY KALAYAAN NATIONAL HIGH SCHOOL									
TABLE OF SPECIFICATION											
Scho	KALAYAAN NATIONAL HIGH SCHOOL	Grade level & Subject:	8 SCIENCE 8								
Distric	CND II	Quarter:	1ST								
Scho ol	JUANITO B. VICTORIA L.I.b., Ph.D.	School ID:	305382								
Learning Competencies		Duration (Hours)	%	No. of Questions	COGNITIVE PROCESS DIMENSION						Test Item Placement
The learners should be able to...					Remembering	Understanding	Applying	Analyzing	Evaluating	Creating	
1	Identify and explain the factors that affect potential energy (S8FE-Ic-22)	2	33	10	3 (1, 2, 3)	1 (4)	2 (5, 6)	2 (7, 8)	2 (9, 10)		1–10
2	Identify and explain the factors that affect kinetic energy (S8FE-Ic-22)	2	33	10	2 (11, 12)	4 (13, 14, 15, 16)	2 (17, 18)	1 (19)	1 (20)		11–20
3	Infer the relationship between current and voltage (S8FE-Ih-30)	2	34	10	1 (21)	1 (22)	2 (23, 24, 25)	1 (26)	4 (27, 28, 29, 30)		21–30
TOTAL		20	100	30	6	6	7	4	7	0	30
Prepared by:		Date Submitted:		April 22, 2023							
JANESSA J. NADA											

APPENDIX I

30 ITEMS TEST

Department of Education
NATIONAL CAPITAL REGION
CALOOCAN CITY
KALAYAAN NATIONAL HIGH SCHOOL
TEST IN SCIENCE 8

Name: _____

Grade and Section: _____

MULTIPLE CHOICE

Direction: Write the letter of the correct answer.

1. Which of the statements below BEST demonstrates potential energy?

- A. A woman running at 4m/s
- B. A fruit falling from a tree
- C. Five gymnasts pull a tumble mat
- D. A man lying on her bed 0.5 meter above the ground

2. This is a stored energy that depends upon the relative position of various parts of a system.

- A. Kinetic Energy
- B. Chemical Energy
- C. Potential Energy
- D. Mechanical Energy

3. Which of the following is NOT an example of Potential Energy?

- A. Car on a hill
- B. Car in motion
- C. Apples in a tree
- D. Stored water in a dam

4. The mass and the height of an object is directly proportional to the Gravitational Potential Energy (GPE). What can you infer from the statement?

- A. True
- B. False
- C. A and B
- D. None of the above

5. How much is the gravitational potential energy of a 2kg-chair being lifted 10 m from the floor? Let $g = 9.8\text{m/s}^2$

- A. 193J B. 194 J C. 195 J D. 196 J

6. How much is the gravitational potential energy of a 3-kg table being lifted 10 m from the floor? Use $g = 9.8\text{m/s}^2$

- A. 120 J C. 150 J
- B. 130 J D. 294 J

7. The greater the mass or height of an object, the lesser the GPE. What can you infer from the statement?

- A. Gravitational potential energy increases as weight and height increases.
- B. Gravitational potential energy increases as weight and height decreases.
- C. Gravitational potential energy increases as weight and height stays the same.
- D. Both a and b

8. How does gravity affect the potential energy?

- A. It is the intensity of the force.
- B. It impacts how much energy the body will have.
- C. It determines how much potential energy it has
- D. The gravity associated with potential energy changes with distance

9. Which of the following is a factor affecting Potential Energy?

- A. Area
- B. Height
- C. Density
- D. Velocity

10. Which is NOT a factor that affects Potential Energy?

- A. mass
- B. height
- C. weight
- D. density

11. What is the formula for Kinetic energy?

- A. mgh
- B. mg/h
- C. $\frac{1}{2}mv^2$
- D. $\frac{1}{2}mv$

12. Which is the unit of measurement for kinetic energy?

- A. Gram
- B. Newton
- C. Joules
- D. Kilogram

13. Which of the following refers to an energy of a moving object?

- A. Kinetic Energy
- B. Potential Energy
- C. Chemical Energy
- D. Thermal Energy

14. If the energy of an object has motion, what type of energy can you infer from these?

- A. Chemical Energy
- B. Kinetic Energy
- C. Mechanical Energy
- D. Potential Energy

15. Which is NOT an example of Kinetic Energy?

- A. A cat sitting
- B. Working People
- C. Playing children
- D. Skateboarding boys

16. Which of the following does NOT belong to the factors affecting Kinetic Energy?

- A. mass
- B. speed
- C. density
- D. velocity

17. How much is the kinetic energy of a 5kg toy car if it is moving with 10m/s velocity?

- A. 250 J
- B. 260 J
- C. 270J
- D. 280 J

18. A 5 kg toy car has a velocity of 10 m/s. What is the car's kinetic energy?

- A. 13 J
- B. 30 J
- C. 150 J
- D. 250 J

19. Based on the position of a cart on diagram below, at which point is potential energy greatest?

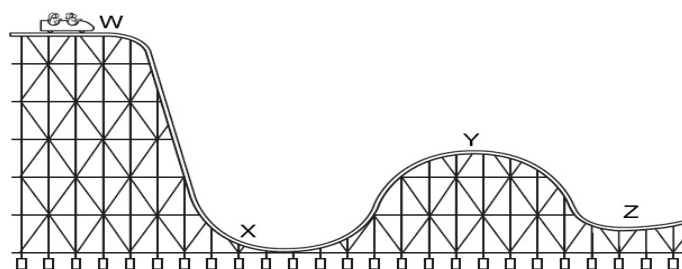


Photo credit: <https://bit.ly/3DU2zxh>

- a. W
- b. X
- c. Y
- d. Z

20. What are the two things that affect Kinetic Energy?

- A. Gravity and Velocity
- B. Mass, gravity, and velocity
- C. Mass and velocity
- D. Velocity and height

21. Who is the scientist that describes the measurement of applied voltage and current?

- A. George Simon Ohm
- B. Alessandro Volta
- C. Andre Marie Ampere
- D. Anton Van Leeuwenhoek

22. Which of the following refers to the potential difference or electromotive force?

- A. charge
- B. Current
- C. Resistance
- D. Voltage

23. An 18-volt source needs to power a 3-A bulb, what would be the suitable wire resistance for the circuit?

- A. 0.17 Ω wire
- B. 3 Ω wire
- C. 6 Ω wire
- D. 54 Ω wire

24. How much voltage is needed to run a 10-A of current through a 4 Ω resistor?

- A. 39V
- B. 40V
- C. 41V
- D. 42V

25. How much current flows through a lamp with a resistance of 40 Ω , when it is connected to a 110-V outlet?

- A. 0.275A
- B. 2.75A
- C. 27.5A
- D. 275A

26. Which of the following statement BEST describes the relationship of kinetic energy of an object to its mass and velocity?

- A. The kinetic energy of an object is directly proportional to its mass and inversely proportional to its squared velocity
- B. The kinetic energy of an object is inversely proportional to its mass and directly proportional to its squared velocity
- C. The kinetic energy of an object is directly proportional to its mass and directly proportional to its squared velocity
- D. The kinetic energy of an object is inversely proportional to its mass and to its squared velocity

27. What will happen to the current if the resistance increases?

- A. it decreases
- B. it increases
- C. stay the same
- D. cannot be determined

28. Which of the following BEST describes the relationship between current and resistance?

- A. Resistance do not directly affect the current
- B. The higher the resistance, the lower the current
- C. The higher the current, the higher the resistance
- D. The higher the voltage, the lower the resistance

29. If the voltage is increased and the resistance stays the same, how would you determine the facts about current?

- A. It will increase
- B. It will decrease
- C. Both a and b
- D. It will stay the same

30. If the voltage stays the same and resistance is increased, how would you determine the facts about current?

- A. It will increase
- B. It will decrease
- C. Both a and b
- D. It will stay the same

APPENDIX J SURVEY QUESTIONNAIRE



National Teachers College
Graduate Program, School of Teacher Education

➤ *Survey Questionnaire*

Difficulties experienced by students in using the Learning Activity Sheets

Name(Optional): _____

Grade and Section: _____

Directions: Below is a list of criteria to rate the difficulties you experienced for using Learning Activity Sheets for Grade 8 Science. Rate each criterion by checking your response using the following scale:

The following are the descriptive values scale used:

1- Strongly Disagree (SD)

3-Agree(A)

2- Disagree(D)

4 -Strongly Agree(SA)

No.	Indicators	1(SD)	2(D)	3 (A)	4(SA)
1.	The content of each lesson in the learning activity sheets is difficult to understand.				
2.	Each topic in the learning activity sheets is not fully discussed.				
3.	The topics are not supported enough by illustrative examples.				
4.	The language used is not clear and not interesting.				
5.	The instructions are hard to follow.				
6.	Explanations of the topic are confusing.				
7.	There are many practice exercises for every lesson				
8.	Printing of the learning activity sheets is in good quality.				
9.	The font size and font style of the learning activity sheets are readable.				
10.	The learning activity sheets are not durable.				

Source: Adapted from Development of Learning Module in Mathematics VIII , Brita 2019

APPENDIX K
LEARNING ACTIVITY SHEET 1





Photo Credit :
<https://www.shutterstock.com>

LEARNING ACTIVITY SHEET IN SCIENCE

POTENTIAL ENERGY

GRADE 8

CREATED BY: JANESEA JAIN NADA

Name: _____

Date: _____ Rating Score:

Potential Energy in Sports



Photo Credit : https://www.freepik.com/premium-vector/cute-style-soccer-player-cartoon-illustration_32715674.htm

Enrico wants to be the best soccer player of all time. Luckily, he is not just good in this sport; he is also good in science. He has an extreme liking for investigations, science projects, and experiments. Because of this, he wants to incorporate science into soccer by using potential energy. However, he has no idea how to do it. Help him identify and explain the various factors that could affect potential energy. Let us help him learn about potential energy, identify, and explain various factors affecting it.

ACTIVITY 1: KNOWING POTENTIAL ENERGY

Objectives:

(a) Define Potential Energy; and (b) Identify different examples of Potential Energy.

Part I. As our first step in learning potential energy, help Enrico identify the different examples of potential energy from the pool of pictures below. Which of the following pictures shows Potential Energy?

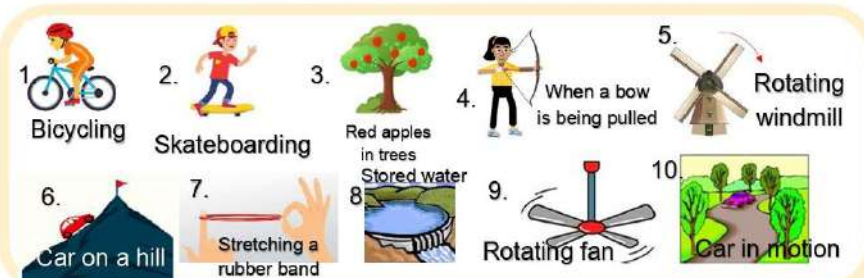


Photo Credit: <https://www.shutterstock.com/search/hand-holding-ball-drawing>, <https://www.shutterstock.com/image-vector/illustration-shows-potential-kinetic-energy-when-1739573918> and https://www.flaticon.com/free-icon/gravity_626983

1 | Week 1

Competency: Identify and explain the factors that affect potential energy

Part II. Direction: Complete the statement about Potential Energy by encircling the choices and supplying needed information.

Based on your answer in Part I you may infer that; Potential Energy is a type of 11. (energy in motion, energy at rest). Examples of this are 12.

13. _____
14. _____
and 15. _____

ACTIVITY 2: WHAT AFFECTS POTENTIAL ENERGY

Objective: Determine the factors affecting the Gravitational Potential Energy (GPE) gained by an object

Let us help Enrico identify and explain the factors affecting the potential energy (PE). There are clues below that will help you unveil the answer.

The factors that directly affect the GPE are the (A) _____ and (C) _____ of an object and the (B) _____.

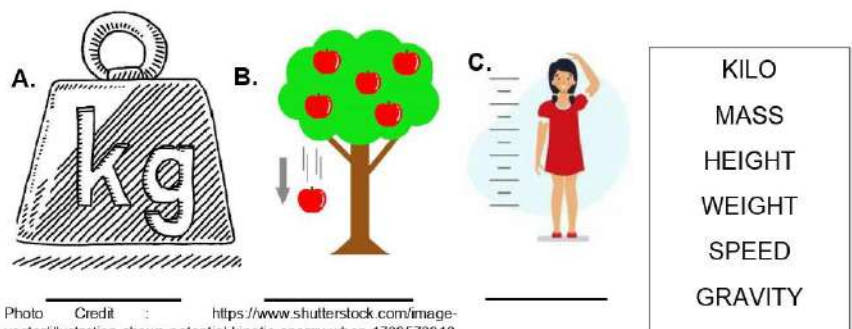


Photo Credit : <https://www.shutterstock.com/image-vector/illustration-shows-potential-kinetic-energy-when-1739573918>

Then, encircle the correct answer from the parenthesis to complete the statements.

The mass and the height of an object is **(directly, inversely)** proportional to the GPE.

Meaning, **the greater the mass or height** of an object, the (greater, lesser) the GPE.

2 | Week 1
Competency: Identify and explain the factors that affect potential energy

ACTIVITY 3: COMPUTATION FOR POTENTIAL ENERGY

Great! That's a start! We now have the idea of Potential Energy from the illustrations you and Enrico saw.

However, **Potential Energy (PE)** of an object can be computed using the formula **$PE = mgh$** where in, **m** is the **mass**, **g** is the constant **acceleration due to the value of gravity** in (**$g = 9.8 \text{ m/s}^2$**), and **h** is the **height of the object** relative to the reference point.

Let us have a **sample problem** as your guide in answering the given problem below:

A toy hangs from a tree. It is 1 kilogram and is about to fall to the ground. If the toy is 10 meters from the ground, how much potential energy does it possess?

Let us use GRESA (Given, Required, Equation/Formula, Solution, and Answer).

Given – $m = 1 \text{ kilogram}$

$g = 9.8 \text{ m/s}^2$

$h = 10 \text{ m}$

Required – $PE = ?$

Equation - $PE = mgh$

Solution – $PE = mgh$

$= (1 \text{ kilogram}) (9.8 \text{ m/s}^2) (10 \text{ meters})$

$= 98 \text{ Joules}$

Answer – 98 Joules , 98 J or $98 \text{ kg m}^2/\text{s}^2$

Now, help Enrico solve the potential energy in the following scenarios. Read and analyze the given situation. Solve the problems systematically using the GUESA (Given, Required, Equation/Formula, Solution, and Answer).

3 | Week 1

Competency: Identify and explain the factors that affect potential energy

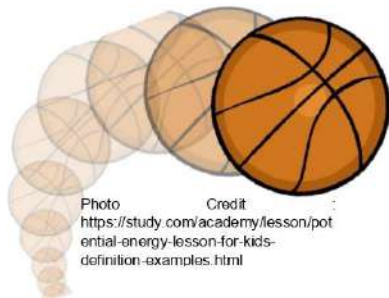


Photo
<https://study.com/academy/lesson/potential-energy-lesson-for-kids-definition-examples.html>

Credit

1. What will be the gravitational potential energy of a ball with mass of 10 kg when it is raised to 6 m above the ground. ($g = 9.8 \text{ m/s}^2$)

2. A mass of 5Kg is taken from the ground to the height of 100m. Find the potential energy of the object. ($g = 9.8 \text{ m/s}^2$)

4 | Week 1

Competency: Identify and explain the factors that affect potential energy

3. Enrico is about to kick the ball. His foot is at rest. Compute the Potential Energy. Mass is 60 Kg, the height above the ground is 5m and the acceleration due to the gravity is 9.8m/s^2 .
Criteria: 2 pts for the solution; 2 pts for answer.



Self-Check

Directions: Encircle the letter of the correct answer.

1. This is a stored energy that depends upon the relative position of various parts of a system.
A. Kinetic Energy
B. Chemical Energy
C. Potential Energy
D. Mechanical Energy
2. Which of the following is a property of potential energy?
A. A property of a system and not of an individual body or particle
B. Not a property of a system and not of an individual body or particle
C. A property of a system and an individual body or particle
D. Not a property of a system but of an individual body or particle
3. Which of the following is **NOT** an example of Potential Energy?
A. Apples in a tree
B. Car on a hill
C. Car in motion
D. Stored water in a dam

5 | Week 1

Competency: Identify and explain the factors that affect potential energy

4. Which of the following is an example of a Potential Energy?
 - A. Rotating fan
 - B. Skateboarding
 - C. Apples in a tree
 - D. A woman riding a bicycle
5. Which of the following is a factor affecting Potential Energy?
 - A. Area
 - B. Height
 - C. Surface area
 - D. Acceleration
6. Which is **NOT** a factor that affects Potential Energy?
 - A. mass
 - B. height
 - C. surface area
 - D. gravitational acceleration
7. Why are there factors affecting Potential Energy?
 - A. The energy not possessed by an object because of its position in relation to other objects, internal tensions, electric charge, or other causes.
 - B. The energy possessed by an object because of its position in relation to other objects, internal tensions, electric charge, or other causes.
 - C. The energy possessed by an object because of its position in relation to other objects, internal tensions, electric charge, or other causes which was discharged.
 - D. The energy possessed not by an object because of its position in relation to other objects, internal tensions, electric charge, or other causes which was discharged but more importantly the energy at rest.
8. How does gravity affect the potential energy?
 - A. It impacts how much energy the body will have.
 - B. It is the intensity of the force.
 - C. It determines how much potential energy it has.
 - D. It identifies how much gravity needed for the potential energy.
9. What will be the gravitational potential energy of a 1 kg ball when it is raised to 6 m above the ground? ($g = 9.8 \text{ m/s}^{-2}$)
 - A. 90 J
 - B. 9.8 J
 - C. 980 J
 - D. 98.0 J

6 | Week 1

Competency: Identify and explain the factors that affect potential energy

10. If the mass of the hammer is 2 kg lifted about 0.4 m up, what could be its Potential Energy if $g = 9.8 \text{ m/s}^2$?
- A. 7.84 J
B. 78.4 J
C. 784 J
D. 784.0 J

REFLECTION

Share the lesson you have learned in this Activity Sheet. You may also add how you can observe Potential Energy in your everyday life.

[illegible]

7 | Week 1
Competency: Identify and explain the factors that affect potential energy

Key to Correction**I. ACTIVITY 1: KNOWING POTENTIAL ENERGY****Part 1**

1. 3 Red Apples
2. 4 When a Bow is being pulled
3. 6 Car on a Hill
4. 7 Stretching a rubber band
5. 8 Stored water in a Dam

Part II

6-10 Potential energy (PE) is a type of energy at rest.

II. ACTIVITY 2: WHAT AFFECTS POTENTIAL ENERGY

- A. Mass
- B. Gravity
- C. Height

4-10. Model Answer

Potential energy is determined by the following three factors:

The factors that directly affect the GPE are the (A) MASS, (C) HEIGHT of an object and the (B) GRAVITY. The mass and the height of an object are **directly**, inversely) proportional to the GPE. Meaning, the greater the mass or height of an object, the **greater**, lesser) the GPE.

III. ACTIVITY 3: COMPUTATION FOR POTENTIAL ENERGY

1-3. Solution

Given: Mass of object $m=10\text{kg}$.
Height $h=6\text{m}$.
Acceleration due to gravity $g=9.8\text{m/s}^2$

Required: PE = ?

Equation: Potential Energy of object $P.E=m \times g \times h$

Solution: $PE = mgh = 10\text{kg} \times 9.8\text{ m/s}^2 \times 6\text{ m}$
 $PE=588\text{ J}$

Answer: **Energy possessed by the object is 588 Joule, 588 J or 588 kg m^2/s^2 or N.m (Newton meter)**

4 - 6. Solution

Given: Mass of object(m)= 5kg .
Height(h)= 100m .
Acceleration due to gravity(g)= 9.8 m/s^2

Required: PE = ?

Equation: Potential Energy of object $P.E=m \times g \times h$

8 | Week 1

Competency: Identify and explain the factors that affect potential energy

Solution:

$$\Rightarrow mgh = 100\text{m} \times 9.8 \text{ m/s}^2 \times 5\text{kg}$$

$$= 4,900 \text{ Joules, } 4,900 \text{ J or } 4,900 \text{ kg m}^2/\text{s}^2$$

Answer: **Energy possessed by the object is 4,900 Joule, 4,900 J or 4,900 kg m²/s²**

7 – 10. Solution

Given: Mass of object (m)=60kg.

Height(h)=5m.

Acceleration due to gravity (g)=9.8 m/s²

Required: PE = ?

Equation: Potential Energy of object P.E=m×g×h

Solution:

$$\Rightarrow mgh = 60 \text{ kg} \times 9.8 \text{ m/s}^2 \times 5\text{m}$$

$$= 2,940 \text{ Joules, } 2,940 \text{ J or } 2,940 \text{ kg m}^2/\text{s}^2$$

Answer: **Energy possessed by the object is 2,940 Joules, 2,940 J or 2,940 kg m²/s² or 2,940 Newton meter (N.m)**

Self-Check

1. C
2. A
3. D
4. C
5. B
6. C
7. B
8. C
9. D
10. A

9 | Week 1

Competency: Identify and explain the factors that affect potential energy

BIBLIOGRAPHY

Britannica. (2018). Potential energy. Retrieved from Britannica:
<https://www.britannica.com/science/potential-energy>

Department of Education. (2020). Most Essential Learning Competencies. Retrieved from
Department of Education: <https://dcpnhs.net/wp-content/uploads/2020/06/Science-MELCs.pdf>

Ebbings, J. (2019). Physics for Kids: Potential energy. Retrieved from Ducksters:
https://www.ducksters.com/science/physics/potential_energy.php

<https://www.pinoytechnoguide.com/2013/01/potential-energy-formula-and-sample.html>

PHOTO CREDITS

https://www.freepik.com/premium-vector/cute-style-soccer-player-cartoon-illustration_32715674.htm

https://www.flaticon.com/free-icon/gravity_626983

<https://www.shutterstock.com/search/hand-holding-ball-drawing>

<https://www.shutterstock.com/image-vector/illustration-shows-potential-kinetic-energy-when-1739573918>

<https://study.com/academy/lesson/potential-energy-lesson-for-kids-definition-examples.html>

<https://selftution.com/mechanical-energy-difference-between-gravitational-elastic-potential-and-kinetic-energy-with-examples/>

<https://anypics.homes/potential-energy-examples-pictures>

10 | Week 1

Competency: Identify and explain the factors that affect potential energy

SCORE SHEET

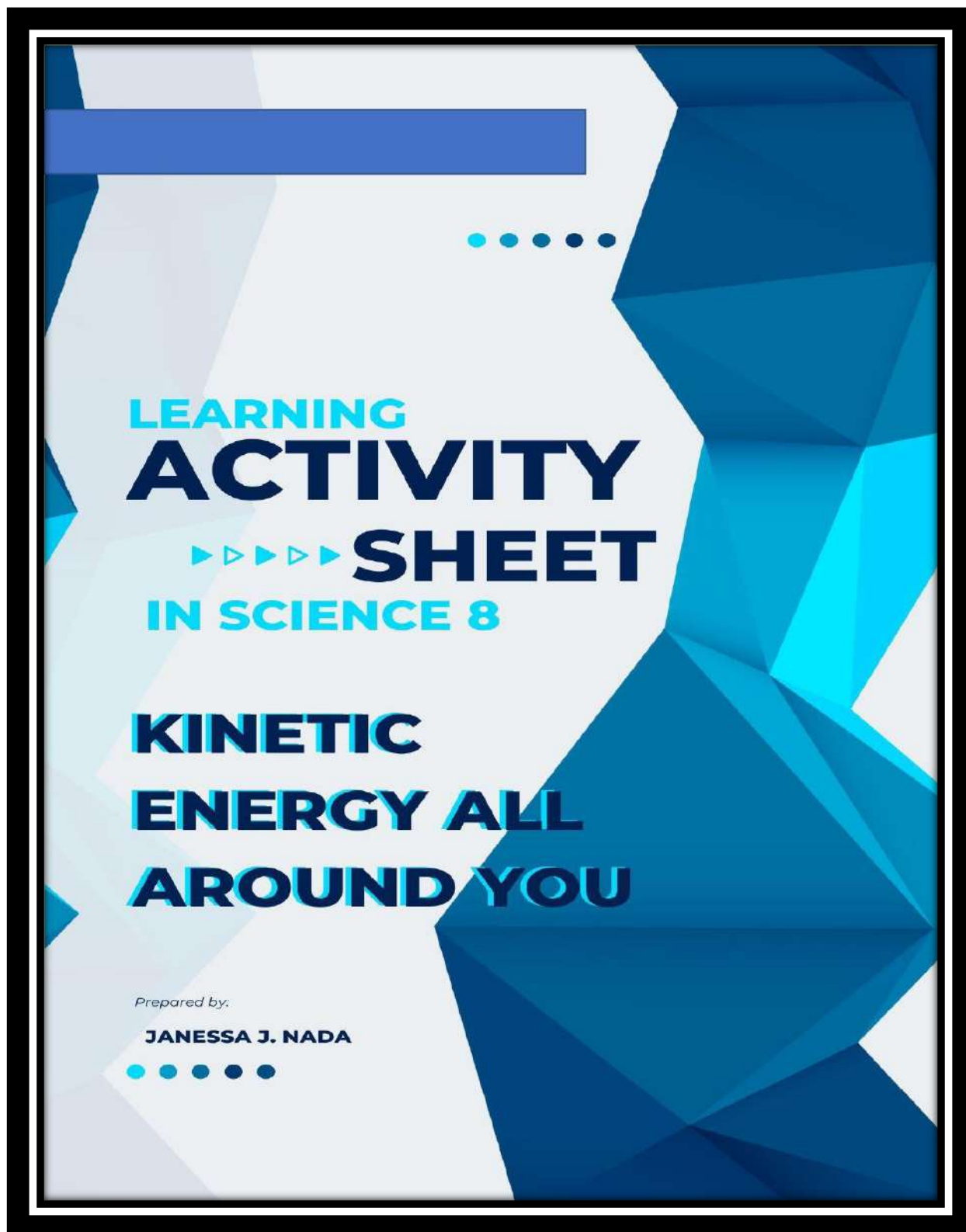
ACTIVITY	SCORE
ACTIVITY 1: KNOWING POTENTIAL ENERGY	
ACTIVITY 2: WHAT AFFECTS POTENTIAL ENERGY	
ACTIVITY 3: COMPUTING FOR POTENTIAL ENERGY	
SELF CHECK	

Name:	
Grade and Section:	
Parent's Signature:	
Teacher's Signature:	

11 | Week 1

Competency: Identify and explain the factors that affect potential energy

APPENDIX L
LEARNING ACTIVITY SHEET 2





LEARNING ACTIVITY SHEET IN SCIENCE

KINETIC ENERGY

GRADE 8

CREATED BY: JANESSA JAIN NADA

Photo Credit : <https://bit.ly/KineticEnergyJJN>

Name: _____

Date: _____ Rating Score:

Kinetic Energy All Around You

Kinetic energy is all around us. Kinetic energy is the energy that a moving item possesses. If we want an item to accelerate, we must apply a force. Using force compels us to perform labor. After work is performed, energy is transferred to the item, and the object's velocity will become constant.

In this Learning Activity Sheet, our task is to help the three siblings Jay, Jane, and Jayson in their discovery of Kinetic Energy.

ACTIVITY 1: KINETIC ENERGY IN A NUTSHELL

Objectives: (a) Define Potential Energy; and (b) Identify different examples of Potential Energy.

Jane is always ahead in her class. She always sees to it that she will have an advance study of the topic. It so happens Kinetic Energy will be their next topic. She wants to know Kinetic Energy in a nutshell to prepare for next class.

Part 1. In a pool of words, help Jane categorize the different descriptions for Kinetic Energy. You need to have five. Using these words, describe Kinetic Energy. (10 points)



Pool of Words

- $\frac{1}{2} m \times v^2$
- $m \times g \times h$
- The energy an object has because of its motion.
- The energy of an object at rest.
- sitting person.
- spinning turbine.
- affected by mass and speed.
- has mass, gravity, and height.
- It is also connected with velocity.

Kinetic Energy

--

Photo Credit : <https://bit.ly/KineticEnergy002JJN>

1 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

Part II. Encircle your answer.

To sum it up, KINETIC ENERGY is a **(6) (energy in motion, energy at rest)**.

An example of this is **(7) (sitting person, spinning turbine)**.

The formula for this is **(8) ($KE=1/2mv$), ($KE=1/2mv$)**. The factors affecting kinetic energy of an object are **(9) (mass and height), (mass and speed)**. It is also connected with **(10) (height, velocity)**.

ACTIVITY 2: KINETIC ENERGY AND ITS FACTORS

Objectives: Determine the factors affecting the Kinetic Energy.

Jane already has the idea of Kinetic Energy. Let us now help Jayson in understanding the factors that affect the energy of an object. Let us use the clues below to unveil the answer. (10 points)

1

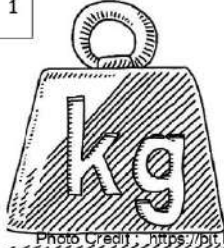


Photo Credit : <https://bit.ly/KineticEnergy003JNN>

2



KILO
MASS
ACTIVE
SPEED
ENERGY

Why do you think it affects the kinetic energy?

The factors affecting Kinetic Energy of an object are **(3)**_____ and **(4)**_____.

The kinetic energy of an object is **5 (directly, inversely)** proportional to its mass and **6 (directly, inversely)** proportional to the square of its velocity.

2 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

ACTIVITY 3: KINETIC ENERGY AS SEEN IN NUMBERS

Objectives: Calculate the Kinetic Energy of an object.

This time, let us visit Jay. Jane heard that he has a problem understanding how to compute the Kinetic Energy. Before we go there, remember from the pool of words, K.E. = $\frac{1}{2} m v^2$ from the pool of words. If the mass has units of kilograms and the velocity of meters per second, the kinetic energy has units of kilograms-meters squared per second squared.

Let us look at this example:

What is the Kinetic Energy of a 150 kg of a moving car with a speed of 15 m/s?



Let us use GRESA (Given, Required, Equation/Formula, Solution, and Answer).

Given – $M = 150 \text{ kg}$

$V = 15 \text{ m/s}$

Required – K.E = ?

Equation – $K.E = 0.5 m v^2$

Solution – $K.E = 0.5m v^2$

$= 0.5 (150 \text{ kg}) (15 \text{ m/s})^2$

$= 0.5 (150 \text{ kg}) (225 \text{ m}^2/\text{s}^2)$

Answer – $16,875 \text{ kg m}^2/\text{s}^2$ or $16,875 \text{ Joules}$

Are we ready? Let us help Jay!

1. Calculate the kinetic energy in Joules possessed by a 4 kg wooden block moving at 2 m/s. (2 points – answer; 3 points – solution; follow the GRESA)

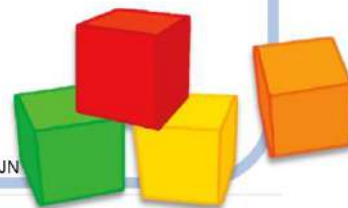


Photo Credit: <https://bit.ly/KineticEnergy002JJN>

3 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

2. Calculate the kinetic energy in Joules possessed by a 71 kg man walking at 1.0 m/s (2 points – answer; 3 points – solution; follow the GRESA)



Photo Credit : <https://bit.ly/KineticEnergy002JJN>

Self-Check

I. Directions: Encircle the letter of the correct answer.

1. This is the energy an object has because of its motion.

A. Chemical Energy	C. Mechanical Energy
B. Kinetic Energy	D. Potential Energy
2. What is true about Kinetic Energy?

I. To accelerate an object, force should be applied.	II. Kinetic Energy of an object is greater when the object has a greater mass.
III. Gravity is also needed in considering the Kinetic Energy	
A. I and II	C. I only
B. III only	D. II and III
3. What is the formula for Kinetic energy?

A. $m g h$	C. $\frac{1}{2} m v^2$ or $0.5 m v^2$
B. $m g/h$	D. $\frac{1}{2} m v$ or $0.5 m v$
4. What are the two things that affect Kinetic Energy?

A. Gravity and Velocity	C. Mass and velocity
B. Mass, gravity, and velocity	D. Velocity and height
5. Which of the following situations exemplify the involvement of Kinetic Energy?

A. Working People	C. Playing children
B. A cat sitting	D. Skateboarding boys

4 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

II. Directions: Read each item below. Encircle "A" if the first choice is the only thing connected to the item; encircle "B" if it is the only one connected to the item; "C" if both relate to the item; and "D" if none of them relates to the item.

6. Example of Kinetic Energy
 - A. Kicking a ball towards the goal
 - B. Sleeping Child
 - C. Both relate to the item
 - D. None of them relates to the item
7. Factors affecting Kinetic Energy
 - A. The motion of an object depends on how fast it's traveling.
 - B. Kinetic energy depends on the velocity of the object squared.
 - C. Both relate to the item.
 - D. None of them relates to the item.
8. Kinetic Energy's unit of measurement
 - A. Gram
 - B. Joules
 - C. Both relate to the item.
 - D. None of them relates to the item.
9. Kinetic energy in Joules possessed by a 66 kg woman running at 8.0 m/s.
 - A. 1,000 Joules
 - B. 3,000 Joules
 - C. Both relate to the item.
 - D. None of them relates to the item.
10. Kinetic energy of a ball possessing 8 kg at a speed of 12 m/s.
 - A. 576 Joules
 - B. 586 Joules
 - C. Both relate to the item.
 - D. None of them relates to the item.

5 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

REFLECTION

Share the lesson you have learned in this Activity Sheet. You may also add how you can observe Kinetic Energy in your everyday life.

[illegible]

6 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

Answer Keys**I. ACTIVITY 1: KINETIC ENERGY IN A NUTSHELL****Part I**

1. B
2. C
3. F
4. G
5. I

Part II

6-10. Model Answer: Kinetic Energy (KE) is the **6. energy in motion**. It is computed using **7. $KE = \frac{1}{2}mv^2$** because it affected by **8. mass and speed**. It is also connected with **9. velocity**. An example is **10. spinning turbine**.

II. ACTIVITY 2: KINETIC ENERGY AND ITS FACTORS

1. Mass
2. Speed

. Model Answer

The factors affecting Kinetic Energy of an object are **(3) _____** and **(4) _____**.

The kinetic energy of an object is **5 (directly, inversely)** proportional to its mass and **6 (directly, inversely)** proportional to the square of its velocity.

The two main factors that affect kinetic energy are mass and speed. Why? Because the motion of an object depends on how fast it's traveling, but also how much mass it has, though velocity is the more important factor.

III. ACTIVITY 3: KINETIC ENERGY IN NUMBERS

1 - 5. Solution

Given: Mass of object $m=500\text{ g}$.

Velocity $v = 2\text{ m/s}$

Required: $KE = ?$

Equation: Kinetic Energy of object $KE = \frac{1}{2}mv^2$

Solution:

$$KE = mv^2 = \frac{1}{2} \times 4\text{ kg} \times (2\text{ m/s})^2$$

$$KE = mv^2 = \frac{1}{2} \times 4\text{ kg} \times (2\text{ m/s})^2$$

$$KE = 8\text{ J}$$

Answer: **Kinetic energy 8 Joule.**

7 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

6 - 10. Solution

Given: Mass of object $m = 71 \text{ kg}$.

Velocity $v = 1 \text{ m/s}$

Required: $KE = ?$

Equation: Kinetic Energy of object $K.E = \frac{1}{2} mv^2$

Solution:

$$\Rightarrow mv^2 = \frac{1}{2} \times 71 \text{ kg} \times (1 \text{ m/s})^2$$

$$\Rightarrow mv^2 = \frac{1}{2} \times 71 \text{ kg} \times (1 \text{ m/s})^2$$

$$= 35.5 \text{ J}$$

Answer: **Kinetic energy 35.5 Joules**

Self-Check

1. B
2. A
3. C
4. C
5. B
6. A
7. C
8. B
9. D
10. A

8 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

REFERENCE LIST

Khan Academy. (2018). *What is kinetic energy?* Retrieved from Khan Academy, retrieved last March 10, 2023: <https://www.khanacademy.org/science/physics/work-and-energy/work-and-energy-tutorial/a/what-is-kinetic-energy#:~:text=Kinetic%20energy%20depends%20on%20the,doubles%2C%20it%20kinetic%20energy%20quadruples>.

PHOTO CREDITS

<https://www.vecteezy.com/vector-art/7152949-cartoon-little-girl-reading-a-book>

<https://www.pngwing.com/en/free-png-secrk>

<https://easydrawingguides.com/how-to-draw-a-person-running/>

<https://www.istockphoto.com/illustrations/fast-car-moving>

9 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

SCORE SHEET

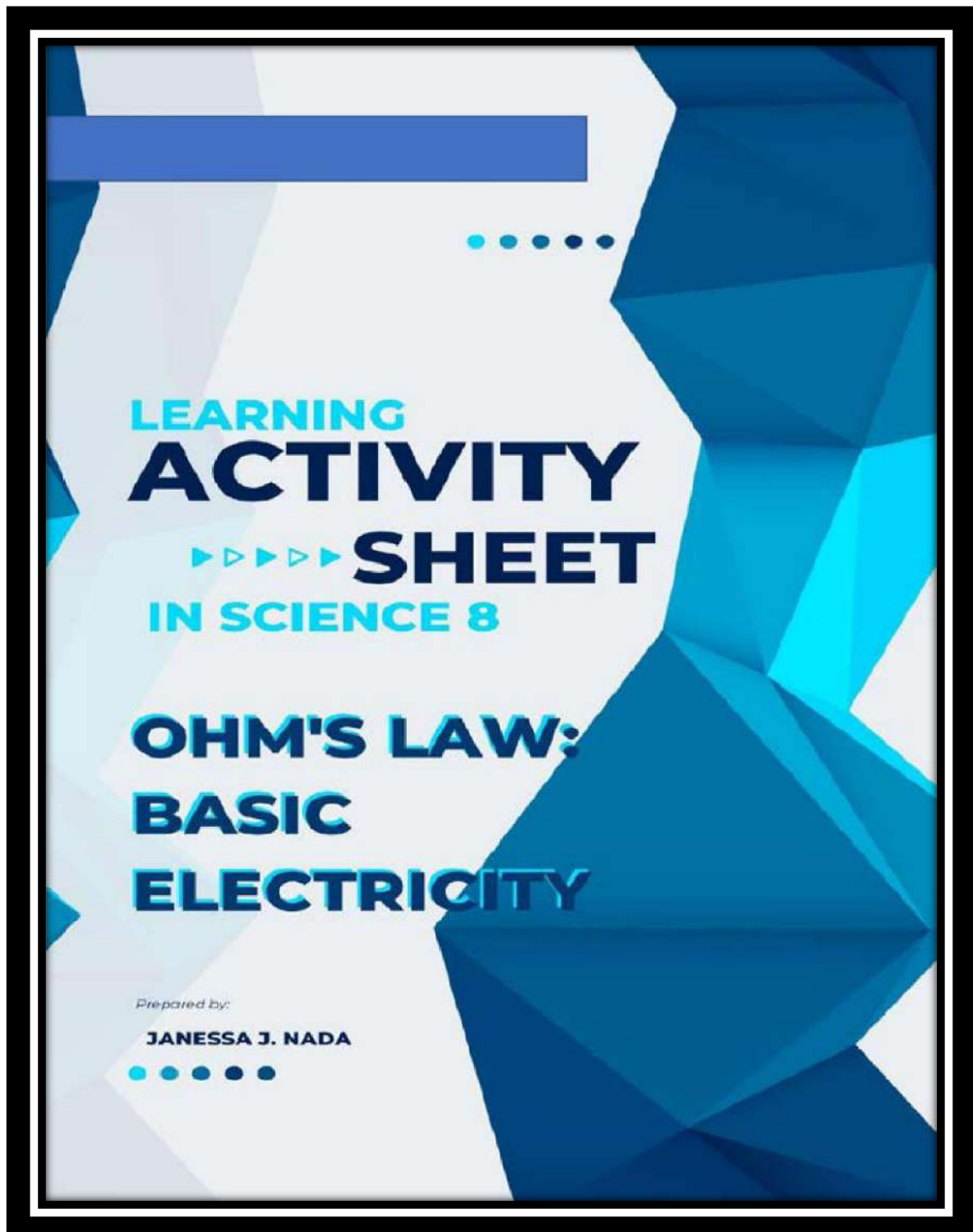
ACTIVITY	SCORE
ACTIVITY 1: KINETIC ENERGY IN A NUTSHELL	
ACTIVITY 2: KINETIC ENERGY AND ITS FACTORS	
ACTIVITY 3: KINETIC ENERGY AS SEEN IN NUMBERS	
SELF CHECK	

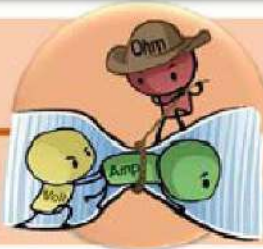
Name:	
Grade and Section:	
Parent's Signature:	
Teacher's Signature:	

10 | Week 2

Competency: Identify and explain the factors that affect kinetic energy

APPENDIX M
LEARNING ACTIVITY SHEET 3





LEARNING ACTIVITY SHEET IN SCIENCE

OHM'S LAW

GRADE 8

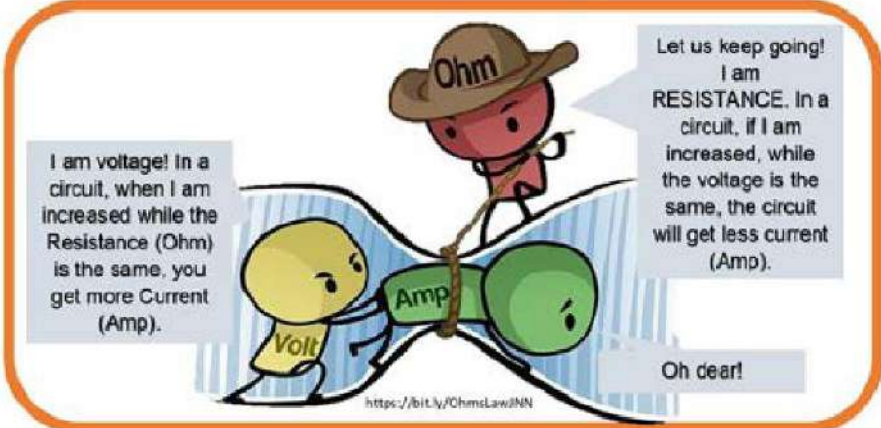
CREATED BY: JANESEA J. NADA

Photo Credit: <https://bit.ly/OhmsLaw/NN>

Name: _____

Date: _____ **Rating**

OHM's Law: Basic Electricity



<https://bit.ly/OhmsLaw/NN>

ACTIVITY 1: Ohm: On the mission to find the meaning

Objectives: Discuss the relationship of current to voltage and resistance in a circuit.

What have you learned from the Comics above? Answer the guide questions that follow.

1. According to the comic strip, what happened to the current flowing in the circuit if the voltage applied on it was increased while keeping the resistance the same?

1 | Week 3

Competency: Infer the relationship between current and voltage

2. What happened to the current on the circuit if the resistance on the circuit was increased at a constant voltage?

ACTIVITY 2: oHm's: Have It Connected!

Objectives: Infer the relationship of current, voltage and resistance.

Explain the connection of current, voltage, and resistance using the illustration below. Complete the statement by choosing words from the pool of words below. After that, briefly explain the relationship of current, voltage, and resistance.

This picture shows the relationship between current, voltage, and resistance which is expressed by (1) _____. This states that the current flowing in a circuit is (2) _____ to the applied voltage and inversely proportional to the (3) _____ of the (4) _____, provided the (5) _____ remains constant.

POOL OF WORDS

- | | |
|--------------------------|----------------|
| a. directly proportional | b. not equal |
| c. voltage | d. resistance |
| e. Ohm's Law | |
| f. circuit | g. temperature |
| h. energy | |

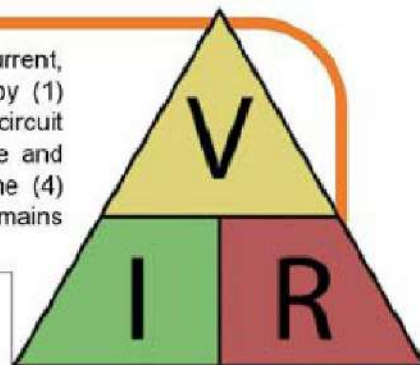


Photo Credit: <https://bit.ly/OhmsLawJNN>

It means that Ohm's Law is _____

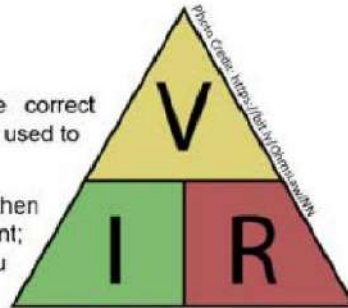
2 | Week 3

Competency: Infer the relationship between current and voltage

ACTIVITY 3: ohM: Measure it!**Objectives:** Solve the problems involving Ohm's Law.

Ohm's Law follows a certain formula for the correct calculation of your electric problems. This triangle can be used to recall Ohm's law.

Put your palm over the V in the triangle, and then observe the R and I. I and R, in its context, are adjacent; hence, you must do a multiplication. This implies you obtain: $V = I \cdot R$



Put your hand over the letter R. Then, you will notice that the V is placed above the I. Thus, you must divide V by I: $R = V / I$.

Put your hand over the letter I. Then, you will notice the V above the R, which indicates that you should divide V by R: $I = V / R$.

A sample problem is given to you:

If the battery voltage in a circuit is 3 V and a resistance 6 Ω flows through it, what is the electric current of the circuit?

Use the GRESA technique (Given, Required, Equation/Formula, Solution, and Answer):

Given – $V = 3$ volts

$R = 6 \Omega$

Required – $I = ?$

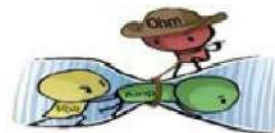
Equation – $I = V/R$

Solution – $I = V/R$

$I = 3 \text{ V} / 6 \Omega$

$I = 0.5 \text{ A}$

Answer – $I = 0.5 \text{ A}$



3 | Week 3

Competency: Infer the relationship between current and voltage

Let us now calculate the following problems:

1. If the resistance of an electric iron is $50\ \Omega$ and a current of $3\ \text{A}$ flows through the resistance. Find the voltage between two points. (2 point – answer; 2 points – following the GRESA)

2. An EMF source of $8.0\ \text{V}$ is connected to a purely resistive electrical appliance (a light bulb). An electric current of $2.0\ \text{A}$ flows through it. Consider the conducting wires to be resistance-free. Calculate the resistance offered by the electrical appliance. (2 point – answer; 3 points – following the GRESA)

4 | Week 3

Competency: Infer the relationship between current and voltage

Self-Check

Directions: Read each item below. Write "A" if the first choice is correct; "B" if the second choice is correct; "C" if both choices are correct; and "D" if both choices are not connected to the item. Write your answer in the space provided.

- _____ 1. Ohm's Law
- A. The relationship between voltage, current, and resistance in an electrical circuit
 - B. The energy stored and exerted by the individual when rest or moving.
- _____ 2. Components of Ohm's Law
- A. It has voltage and resistance.
 - B. It has current in a circuit.
- _____ 3. Derived Formula of Voltage
- A. $I \times R$
 - B. R / I
- _____ 4. Description about Resistance
- A. V / I
 - B. Expressed in terms of Ohms (Ω)
- _____ 5. Description of Current
- A. Current = mc^2
 - B. Other term for voltage
- _____ 6. Relationship of Current to Voltage
- A. Directly proportional
 - B. Inversely Proportional
- _____ 7. Relationship of Resistance to Current
- A. Directly Proportional
 - B. Inversely Proportional

5 | Week 3

Competency: Infer the relationship between current and voltage

- _____ 8. If the resistance of an electric iron is $80\ \Omega$ and a current of $6.0\ \text{A}$ flows through the resistance, find the voltage between two points.
- A. 480 volts
B. 488 volts
- _____ 9. If the voltage of an electric iron is 216 volts and a current of $9.0\ \text{A}$ flows through the resistance, find the resistance between two points.
- A. $215\ \Omega$
B. $217\ \Omega$
- _____ 10. If the voltage of an electric iron is 363 volts and a resistance of $5.0\ \Omega$ flows, find the current between two points.
- A. $7.26\ \text{A}$
B. $72.6\ \text{A}$

6 | Week 3

Competency: Infer the relationship between current and voltage

Answer Keys**I. Activity 1: Ohm: On the mission to find the meaning**

Model Answer:

1. If you increase the voltage (Volt) in a circuit while the resistance is the same, you get more current (Amp).
2. If you increase the resistance (Ohm) in a circuit while the voltage stays the same, you get less current.

II. Activity 2: ohM's: Making Connections

1. E
2. A
3. D
4. F
5. G

6-10. Model Answer

(Answers may vary for as long as they are connected with the correct formed relationship.)

III. ohM: Have me computed

1 - 5. Solution

Given: Resistance (R) = 50 Ω

Current (I) = 3 A

Required: Voltage (V) = ?

Equation: Voltage = $V = I \times R$

Solution:

$$= V = 3 \text{ A} \times 50 \Omega$$

$$= 150 \text{ V}$$

Answer: **The voltage is 150 V.**

6 - 10. Solution

Given: Voltage (V) = 8.0 V

Current (I) = 2.0 A

Required: Resistance (R) = ?

Equation: $R = V \div A$

Solution:

$$= R = 8 \text{ V} \div 2 \text{ A}$$

$$= 4 \Omega$$

Answer: **The computed Resistance (R) is 4 Ω .****8 | Week 3**

Competency: Infer the relationship between current and voltage

Self-Check

1. A
2. C
3. A
4. C
5. D
6. A
7. B
8. A
9. D
10. B

9 | Week 3

Competency: Infer the relationship between current and voltage

REFERENCE LIST

Dhal, O. (2022, September 7). Ohms Law – The Complete Beginner's Guide. Retrieved from Build Electronic Circuits: <https://www.build-electronic-circuits.com/ohms-law/>

Fluke. (2019). What is Ohm's Law? Retrieved from Fluke: <https://www.fluke.com/en-ph/learn/blog/electrical/what-is-ohms-law>

PHOTO CREDITS

<https://www.build-electronic-circuits.com/ohms-law/>

<https://encryptedtbn0.gstatic.com/images?q=tbn:ANd9GcT4fz8OznBGtZ3BFhscZRBxOcTBZhga7hgRUQ&usqp=CAU>

10 | Week 3

Competency: Infer the relationship between current and voltage

SCORE SHEET

ACTIVITY	SCORE
ACTIVITY 1: <u>Ohm</u> : <u>On</u> the mission to find the meaning	
ACTIVITY 2: <u>ohM</u> : <u>M</u> aking Connections	
ACTIVITY 3: <u>oHm</u> : <u>H</u> ave me computed	
SELF CHECK	

Name:	
Grade and Section:	
Parent's Signature:	
Teacher's Signature:	

11 | Week 3

Competency: Infer the relationship between current and voltage

APPENDIX N

TEST OF RELIABILITY

➤ *Pilot Test for the Selected Grade 9 Students*

Mean, Mean percentage Score and Rank of the Performance Level of Grade 8 Students in the Pre-test

Grade and Section	Mean	MPS	Rank
8-6	9.8	32.67	3
8-24	11.9	39.67	1
8-26	9.2	30.67	4
8-28	10.8	36.00	2
Composite Mean	10.3	34.33	

Mean, Mean Percentage Score and Rank of the Performance Level of Grade 8 Students in the Post-Test

Grade and Section	Mean	MPS	Rank
8-6	24.2	80.67	2
8-24	25.5	85.00	1
8-26	22.4	74.67	4
8-28	23.3	77.67	3
Composite Mean	23.85	79.50	

Summary of the Pre-test and Post –test Mean Scores of the Grade 8 Students and their Learning Gains

Grade and Section	Pre-test Mean	Post-test Mean	Learning Gains
8-6	9.80	24.20	14.40
8-24	11.90	25.50	13.60
8-26	9.20	22.40	13.20
8-28	10.80	23.30	12.50
Composite Mean	10.30	23.85	13.55

Significance difference between Pre-test and Post-test score on the use of Learning Activity Sheets

Pre-Test, Post-Test and T-Test Result of the Grade 8 Students

Grade and Section	Pre-test Mean	Post-test Mean	T- test value	Degree of freedom	Critical value at 0.05	Interpretation	Decision
8-6	9.80	24.20	13.21	9	1.383	Significant	Reject Ho
8-24	11.90	25.50	13.51	9	1.383	Significant	Reject Ho
8-26	9.20	22.40	9.72	9	1.383	Significant	Reject Ho
8-28	10.80	23.30	7.38	9	1.383	Significant	Reject Ho

Respondents' Assessment on the Difficulties Experienced by Students in using the Learning Activity Sheets

Indicators	WM	VI
Indicator 1	2.18	DA
Indicator 2	1.63	SA
Indicator 3	1.65	SA
Indicator 4	1.70	SA
Indicator 5	2.00	DA
Indicator 6	2.10	DA
Indicator 7	2.53	A
Indicator 8	1.55	SA
Indicator 9	1.58	SA
Indicator 10	2.05	DA

APPENDIX O

ITEM ANALYSIS IN IDENTIFYING LEAST MASTERED COMPETENCIES FOR GRADE 8-6,
GRADE 8-24, GRADE 8-26 AD GRADE 8-28

KALAYAAN NATIONAL HIGH SCHOOL
Phase 10B, Bagong Silang, Caloocan City

ITEM ANALYSIS WITH MPS, FREQUENCY OF ERRORS AND MASTERY LEVEL

Subject		Grade Level: 8		Section: 6	
Quarter	First	Type of Test	Identifying LMC	No. of Takers	10
				No. Of Items	50

Instruction: Enter the number of students took the test/exam and count the number of students answered correctly per item. Fill in also the number of items.

Competency	No. of Students Answered Correctly	Frequency of Errors		Mastery Level	
		No. of Students got incorrect answer	Remarks	%	Remarks
1	8	2	Minimal Errors	80	Mastered
2	8	2	Minimal Errors	80	Mastered
3	8	2	Minimal Errors	80	Mastered
4	9	1	Minimal Errors	90	Mastered
5	8	2	Minimal Errors	80	Mastered
6	8	2	Minimal Errors	80	Mastered
7	8	2	Minimal Errors	80	Mastered
8	8	2	Minimal Errors	80	Mastered
9	8	2	Minimal Errors	80	Mastered
10	8	2	Minimal Errors	80	Mastered
11	8	2	Minimal Errors	80	Mastered
12	8	2	Minimal Errors	80	Mastered
13	8	2	Minimal Errors	80	Mastered
14	8	2	Minimal Errors	80	Mastered
15	8	2	Minimal Errors	80	Mastered
16	8	4	Minimal Errors	60	Least Mastered
17	6	4	Minimal Errors	60	Least Mastered
18	6	4	Minimal Errors	60	Least Mastered
19	8	2	Minimal Errors	80	Mastered
20	8	2	Minimal Errors	80	Mastered
21	8	2	Minimal Errors	80	Mastered
22	9	1	Minimal Errors	90	Mastered
23	9	1	Minimal Errors	90	Mastered
24	9	1	Minimal Errors	90	Mastered
25	8	2	Minimal Errors	80	Mastered
26	8	2	Minimal Errors	80	Mastered
27	8	2	Minimal Errors	80	Mastered
28	8	2	Minimal Errors	80	Mastered
29	8	2	Minimal Errors	80	Mastered
30	8	2	Minimal Errors	80	Mastered
31	8	2	Minimal Errors	80	Mastered
32	8	2	Minimal Errors	80	Mastered
33	8	2	Minimal Errors	80	Mastered
34	8	2	Minimal Errors	80	Mastered
35	8	2	Minimal Errors	80	Mastered
36	8	2	Minimal Errors	80	Mastered
37	6	4	Minimal Errors	60	Least Mastered
38	6	4	Minimal Errors	60	Least Mastered
39	6	4	Minimal Errors	60	Least Mastered
40	8	2	Minimal Errors	80	Mastered
41	6	4	Minimal Errors	60	Least Mastered
42	8	2	Minimal Errors	80	Mastered
43	8	4	Minimal Errors	60	Least Mastered
44	8	2	Minimal Errors	80	Mastered
45	8	2	Minimal Errors	80	Mastered
46	9	1	Minimal Errors	90	Mastered
47	9	1	Minimal Errors	90	Mastered
48	9	1	Minimal Errors	90	Mastered
49	9	1	Minimal Errors	90	Mastered
50	8	2	Minimal Errors	80	Mastered
MPS	39	76.60	Nearly Mastered		

GRAPH

Mastery Level

Not Mastered	0
Least Mastered	8
Nearly Mastered	0
Mastered	42
TOTAL	50

Frequency of Errors

No Error	0
Minimal Errors	50
Marginal Errors	0
Further Errors	0
TOTAL	50

Prepared by: Janessa J. Nade
Subject Teacher

Reviewed by: Anthony P. Perez
Master Teacher I

Approved by: IMELDA DG SALLARDO
Head Teacher

KALAYAAN NATIONAL HIGH SCHOOL
Phase 10B, Bagong Silang, Calocan City

ITEM ANALYSIS WITH MPS, FREQUENCY OF ERRORS AND MASTERY LEVEL

created by and password: crssslida

Subject	Grade Level: 8		Section: 26	
Quarter	First	Type of Test	Identifying LMC	No. of Takers 10 No. Of Items 50

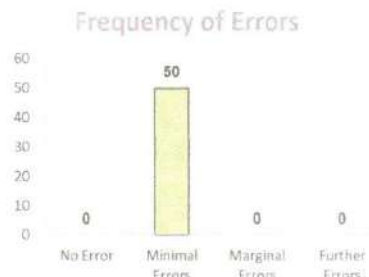
Instruction: Enter the number of students took the test/exam and count the number of students answered correctly per item. Fill in also the number of items.

Competency		No. of Students Answered Correctly	Frequency of Errors		Mastery Level	
			No. of Students got incorrect answer	Remarks	%	Remarks
	1	8	2	Minimal Errors	80	Mastered
	2	8	2	Minimal Errors	80	Mastered
	3	8	2	Minimal Errors	80	Mastered
	4	8	2	Minimal Errors	80	Mastered
	5	8	2	Minimal Errors	80	Mastered
	6	8	2	Minimal Errors	80	Mastered
	7	8	2	Minimal Errors	80	Mastered
	8	8	2	Minimal Errors	80	Mastered
	9	8	2	Minimal Errors	80	Mastered
	10	8	2	Minimal Errors	80	Mastered
	11	8	2	Minimal Errors	80	Mastered
	12	8	2	Minimal Errors	80	Mastered
	13	8	2	Minimal Errors	80	Mastered
	14	8	2	Minimal Errors	80	Mastered
	15	8	2	Minimal Errors	80	Mastered
	16	8	4	Minimal Errors	60	Least Mastered
	17	6	4	Minimal Errors	60	Least Mastered
	18	6	4	Minimal Errors	60	Least Mastered
	19	8	2	Minimal Errors	80	Mastered
	20	8	2	Minimal Errors	80	Mastered
	21	8	2	Minimal Errors	80	Mastered
	22	8	2	Minimal Errors	80	Mastered
	23	8	2	Minimal Errors	80	Mastered
	24	8	2	Minimal Errors	80	Mastered
	25	9	1	Minimal Errors	90	Mastered
	26	8	2	Minimal Errors	80	Mastered
	27	8	2	Minimal Errors	80	Mastered
	28	8	2	Minimal Errors	80	Mastered
	29	8	2	Minimal Errors	80	Mastered
	30	8	2	Minimal Errors	80	Mastered
	31	8	2	Minimal Errors	80	Mastered
	32	8	2	Minimal Errors	80	Mastered
	33	8	2	Minimal Errors	80	Mastered
	34	8	2	Minimal Errors	80	Mastered
	35	8	2	Minimal Errors	80	Mastered
	36	8	2	Minimal Errors	80	Mastered
	37	6	4	Minimal Errors	60	Least Mastered
	38	6	4	Minimal Errors	60	Least Mastered
	39	6	4	Minimal Errors	60	Least Mastered
	40	8	2	Minimal Errors	80	Mastered
	41	6	4	Minimal Errors	60	Least Mastered
	42	8	2	Minimal Errors	80	Mastered
	43	6	4	Minimal Errors	60	Least Mastered
	44	8	2	Minimal Errors	80	Mastered
	45	8	2	Minimal Errors	80	Mastered
	46	8	2	Minimal Errors	80	Mastered
	47	8	2	Minimal Errors	80	Mastered
	48	8	2	Minimal Errors	80	Mastered
	49	8	2	Minimal Errors	80	Mastered
	50	8	2	Minimal Errors	80	Mastered
MPS		39	77.00		Nearly Mastered	

GRAPH



MASTERY LEVEL	
Not Mastered	0
Least Mastered	8
Nearly Mastered	0
Mastered	42
TOTAL	50



FREQUENCY OF ERRORS	
No Error	0
Minimal Errors	50
Marginal Errors	0
Further Errors	0
TOTAL	50

Prepared by:

Janessa J. Nada
Subject Teacher

Reviewed by:

Anthony P. Perez
Master Teacher I

Approved by:

IMELDA M. GALLARDO
Head Teacher VI

APPENDIX P
CERTIFICATE OF STATISTICIAN

