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Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics

YEHLEN VILLEGAS BENDANILLO

A Master's Thesis Presented to the Graduate Faculty of Agusan Colleges, Incorporated

In Partial Fulfillment of the Requirements for the Degree Master of Arts in Education

ABSTRACT: *The problems and challenges encountered by teachers in teaching Science and the low performance of students in some competency in Physics urged this study to develop and validate contextualized intervention material in Physics Grade 9 Science. These will serve as remediation tool in aiding teachers to address least learned competency or competencies in teaching junior high school Science. The fourth quarter summative assessment conducted in school year 2021-2022 among 141 grade 9 students in Jacinto D. Malimas Sr. National High School revealed that the learning competency "describe horizontal and vertical motions of a projectile " is the determined least learned competency for the fourth quarter and the bases of the development and validation on the contextualized intervention material. The three experts from the field of Science validated the material in the terms of content, readability, usability and level of contextualization using the criteria adopted from the SIM making contest stipulated in DepEd Memorandum No. 225, s. 2009. Moreover, the prospective student-users validated the material in terms of readability and usability using the criteria adopted from DepEd Guidelines and Processes for LRMDS Assessment and Evaluation (2009). Both have validation scale in numerical and descriptive rating in four-point range. The results of the validation through the derivation of the weighted mean of each item with its equivalent mean interpretation showed that the developed contextualized intervention material gained an over-all descriptive rating of "excellent" in terms of content, readability, usability and level of contextualization and these material is recommended to be used in remediating students who performed low in the said learning competency.* \

Keywords: contextualized, development, intervention material, validation, least-learned competency

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December 2022

APPROVAL SHEET

This thesis entitled **"Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics"** has been prepared and submitted by **YEHLEN V. BENDANILLO** in partial fulfillment of the requirements for the Degree of Master of Arts in Education, has been examined and is recommended for acceptance and approval for oral examination.

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DEDICATION

To the All-Powerful God for being the origin of everything, to Mama Ely, Ate Grace, Joc-Joc, Jeson, Auntie Bebot, and Alper for giving me energy and inspiring me to keep going, as well as to my beloved students who inspire me to continue studying, and to Tita Nilda U. Villegas for all of her encouragement and advice on how to make my studies better.

This Thesis IS FOR you.

Y.V.B.

ABSTRACT

The problems and challenges encountered by teachers in teaching Science and the low performance of students in some competency in Physics urged this study to develop and validate contextualized intervention material in Physics Grade 9 Science. These will serve as remediation tool in aiding teachers to address least learned competency or competencies in teaching junior high school Science. The fourth quarter summative assessment conducted in school year 2021-2022 among 141 grade 9 students in Jacinto D. Malimas Sr. National High School revealed that the learning competency "describe horizontal and vertical motions of a projectile " is the determined least learned competency for the fourth quarter and the bases of the development and validation on the contextualized intervention material. The three experts from the field of Science validated the material in the terms of content, readability, usability and level of contextualization using the criteria adopted from the SIM making contest stipulated in DepEd Memorandum No. 225, s. 2009. Moreover, the prospective student-users validated the material in terms of readability and usability using the criteria adopted from DepEd Guidelines and Processes for LRMDS Assessment and Evaluation (2009). Both have validation scale in numerical and descriptive rating in four-point range. The results of the validation through the derivation of the weighted mean of each item with its equivalent mean interpretation showed that the developed contextualized intervention material gained an over-all descriptive rating of "excellent" in terms of content, readability, usability and level of contextualization and these material is recommended to be used in remediating students who performed low in the said learning competency.

Keywords: contextualized, development, intervention material, validation, least-learned competency

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THE PROBLEM AND ITS SCOPE

Introduction

Science education in the Philippines nowadays is unquestionably far behind that of other nations. Even though they find science intriguing and important to their lives, students struggle to learn it during this pandemic, according to recent research presented at the American Educational Research Association Conference (Sparks, 2021).

The Philippines received 297 in mathematics and 249 in science, as evidenced by the findings of TIMSS 2019 (Trends in International Mathematics and Science Study), in which 58 countries participated. As a PISA participant, the Philippines scored poorly in mathematics and science, scoring 353 and 357 points, respectively (Magsambol, 2020). Additionally, according to a World Economic Forum report referenced by Fuente, the Philippines was ranked 79th out of 138 nations in 2017 and 67th out of 140 countries in 2016 for its ability to compete internationally in the provision of high-quality science education. (2019). The performance of Filipino children falls toward the low proficiency level on standardized tests given for Grades 6, 10, and 12, namely the National Achievement Test (NAT), particularly in Science, Math, and English according to Education Secretary Leonor Briones (Department of Education Year End Report, 2019).

Many studies have shown that physics is a very boring and difficult topic, and the majority of students view it as challenging for a variety of reasons. The current pandemic in science education is made worse by a number of problems, including a lack of modules, teaching tools, and instructional materials that are in line with the department's required learning outcomes. Modular distant learning is one of the delivery methods used by the department of education. According to a survey conducted by the Department of Education (DepEd), digital and printed modules appeared to be the most preferred distance learning modality of parents with children who enrolled in the academic year (Bernardo, 2020). Digital and printed modules appeared to be the most favored distance learning modality among parents with children enrolled in the academic year, according to a poll performed by the Department of Education (DepEd) (Bernardo, 2020). The Department of Education (DepEd) advocated the use of supplemental resources to enhance the subject areas' competencies as a result of these outcomes (NAT and PISA) in its policy.

The use of Strategic Intervention Materials (SIM) as a kind of remediation to improve the academic achievement of low-performing students in school is one of the instructional materials offered by the Department of Education (DepEd). The purpose of SIM is to help learners master a competency-based ability that they were unable to learn in a traditional classroom setting. Additionally, it aids in their development as self-controlling, successful learners. The DepEd Memorandum No. 117, s. 2005 was released to train teachers to create and deploy SIM in classrooms to address learners' needs through

instructions and interventions in order to ensure the successful implementation of this material (Cordova, et. al 2019). The purpose of this memo is to equip educators with the skills necessary to create a variety of intervention materials for the improvement and enrichment of students' learning. Furthermore, SIM development has been included in Science Fair Contests - Teachers' Category to showcase teachers' abilities in creating resources for students' content mastery. (DepEd Order 225, series 2009).

In the recent DAT conducted by the Division of Gingoog City in the academic year 2021-2022 in grade levels 7, 8, 9, and 10, the overall school MPS in Science at Jacinto D. Malimas Sr. National High School is just 16.3, second to last in all learning areas next to Math with an MPS of 16.13. The researchers felt that contextualized intervention materials for grade 9 science were necessary in light of the significant low proficiency DAT results in science at the current station. These materials would be excellent supplemental learning tools for teachers to use in introducing junior high school physics competencies in order to improve student learning and reduce failure.

Theoretical Framework /Conceptual Framework

This study was framed on the following learning theories of Piaget’s and Vygotsky's Socio-cultural theory. In addition, he proposed that the teacher's responsibility in the learning and teaching process is to give pertinent learning experiences and materials that inspire students to improve their thinking. Piaget (1954) described children as active learners who construct their knowledge.

Furthermore, Vygotsky (1934) claimed that knowledge was derived through MKO instructions (More Knowledgeable Others). Throughout the learning process, the MKO can provide the child with ad hoc scaffolding or support. When introducing new materials and putting their teachings and student interaction in context, teachers might use the principles of assimilation and accommodation from Piaget's learning theory in the classroom (discoverearlychildhoodrdu.org. 2022). Although teachers can help students by giving them the right materials, it is essential that they build their own understanding of the content or reinvent it on their own as cited by Mcleod (2020).

Moreover, the significance of social and cultural context for learning is shaped by Vygotsky. He contends that guided learning within the zone of proximal development results in social interactions where children and their partners co-construct knowledge. According to Vygotsky, a child's environment has an impact on their cognitive development (Mcleod, 2020). The study of contextualized intervention material (CIM) as instructional material used in teaching to target the least taught competencies in physics has significant ramifications for these two theories. Since local resources are used as both subjects and learning tools, encouraging the usage of localized materials will enable learning to become more meaningful and relevant (Macdo, 2018). The same is true for the use of contextualized learning materials to aid students in gaining new abilities and information. Additionally, it aids in the growth of students' abilities, dispositions, and drive to engage in the learning process.

According to Rivet et al. (2008), as cited by Picardal et al. (2022), contextualization is a constructivist strategy and inquiry-based teaching method that bridges the gap between ideas and practical experience. It has gained support from educators, teachers, and legislators. Contextualization is a method of science instruction that could raise students' achievement. Given its popularity, it is essential to assess how contextualization performs overall in comparison to the standard setup in terms of raising students' achievement across all educational levels in all scientific subjects. This is further supported by Bunagan (2012), who revealed that Strategic Intervention Materials (SIM) were intended to reteach the concepts and skills (least learned) as cited by DepEd Order No. 9, 2021, which prescribed strategic intervention materials as instructional materials to improve learners' performance in Science and other subject areas (DepEd Tambayan Ph. Blogs, Sat. Jan.7, 2017). Due to research and citations of Piaget's (1954) theories of learning and Vygotsky's (1979) sociocultural theory of cognitive development, the intervention materials were recognized.

SIMs are instructional tools created for remediation, as stated by Cubillas (2020). They are regarded as one of the strategies used by DepEd to raise the academic performance of students who struggle in class. Additionally, she said that instructional materials must operate as a roadmap for learning; they must be personalized, self-paced, have meaningful and pertinent tasks, and offer something that motivates students to use their existing knowledge and schema. According to a study by Jordan (2020) titled "The Effects of Science Intervention Material in the Academic Performance of Junior High School Students," students

who had access to teacher-made science intervention material performed better academically than those who did not. Students' academic performance can be improved by using science intervention material based on the least-mastered competencies.

The goal of this thesis is to create and validate contextualized science intervention materials to address grade 9 students' least-learned competency in physics. As required in DepEd Order 225, s. 2009, a CIM contains seven (7) cards: a title card, a guide card, an activity card, an assessment card, an enrichment card, an answer key card, and a reference card. Furthermore, the researcher used DepEd Memorandum No. 150, Series 2012 Mastery/Achievement Level, or MPS, to determine the least learned science competency in the field of physics.

The creation and validation of the contextualized intervention material used in this study are guided by the ADDIE model of instruction. The five phases of the instructional design process are called "ADDIE": Analysis, Design, Development, Implementation, and Evaluation. These five steps create a flexible and dynamic framework for creating efficient learning materials and proficiency support systems (Culatta, 2018). Figure 1 illustrates how the researcher developed and validated the materials using the ADDIE paradigm. The latter was approved by experts in the science field in terms of its content, readability, usability, and contextualization level. Additionally, prospective student users can only validate the materials' readability and usability.

Figure 1

Research Paradigm of the Study

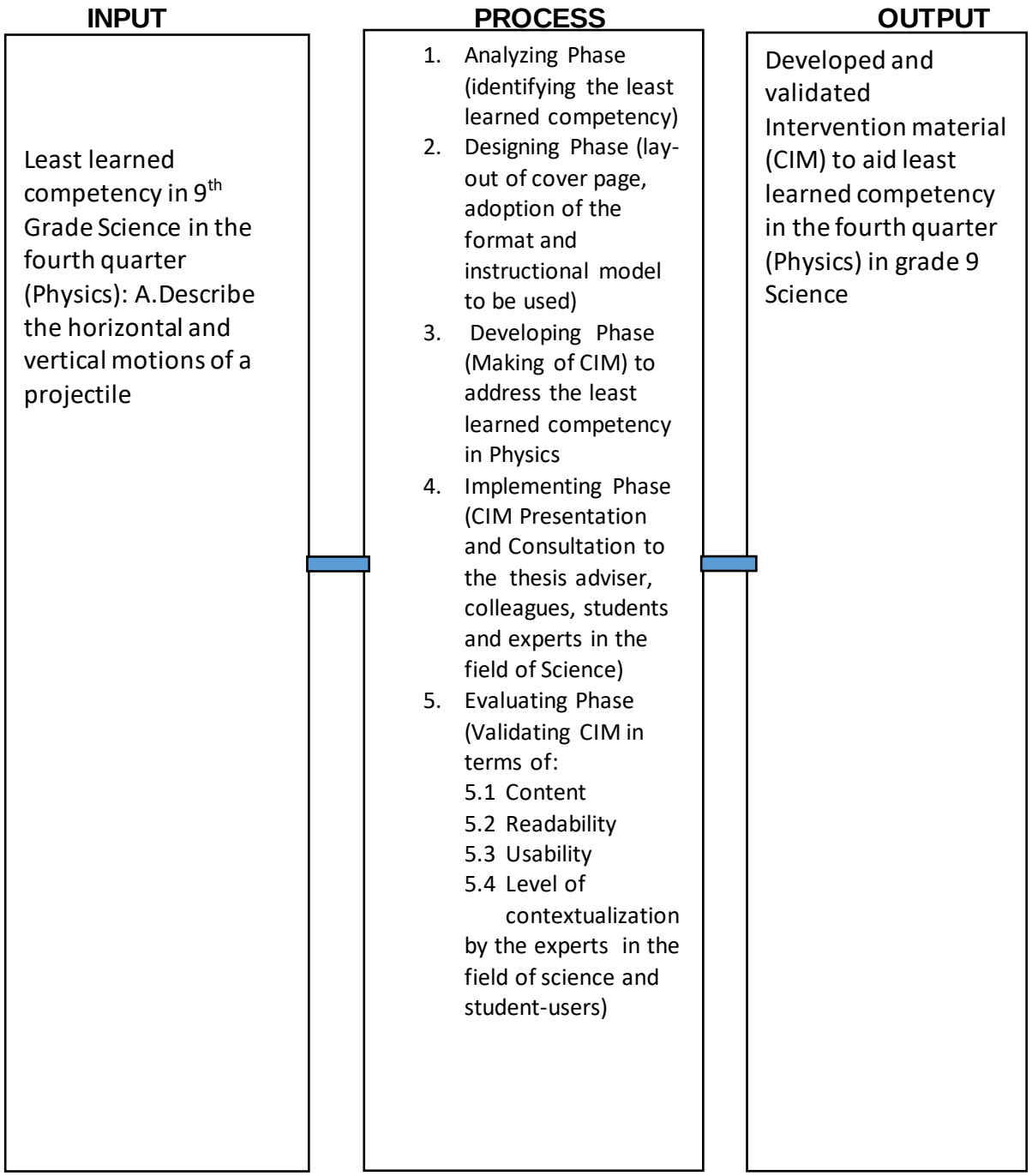

Figure 1 shows the research paradigm of the study on the development and validation of contextualized intervention material

Statement of the Problem

This study aims to develop and validate contextualized intervention material as an aid to address the least learned competency in Physics for the fourth quarter of Grade 9 students at Jacinto D. Malimas Sr. National High School, Division of Gingoog City.

Specifically, it sought to answer the following questions:

1. What are the students least learned competencies in the fourth quarter?
2. What intervention materials may be developed to address the least learned competencies?
3. How will the developed intervention material be validated in terms of :
    3.1 Content;
    3.2 Readability ;
    3.3 Usability;
    3.4 Level of contextualization?
4. On the basis of the findings, what enhanced material may be proposed?

Significance of the Study

This study developed contextualized intervention material as an aid to address the student's least learned competency in Physics. Furthermore, the result of this study is beneficial to the following:

Administrators at Schools. This gives school principals inspiration to encourage their teachers to create contextualized supplemental materials for

student intervention and learning enrichment that can help address the least learned competencies.

Science Teachers. This study can inspire them and provide them with knowledge on how to create contextualized intervention materials for some content in their respective domains. They will benefit from this since the material they have generated can aid in learning to support least-learned competency and student-decreasing achievement.

Students. This will allow students to focus more on learning a particular lesson with contextualized intervention material since it contains a task that calls for active student participation.

Science Supervisors. This can help them understand the significance of contextualized intervention materials in the teaching of science, a subject that requires students to comprehend a wide range of concepts. By doing this, they can motivate science teachers to build contextualized intervention tools that will improve students' content knowledge.

Curriculum Makers. The findings of this study will help them understand the value of supplemental instructional resources, particularly contextualized intervention material, in helping students who struggle with certain science topics. This can alert them to the fact that not all topics in a certain discipline can be covered within the time allotted for a particular topic.

Other Researchers. The results of this study can be used as a reference when creating supplemental materials for teaching students their least acquired

competency. Additionally, this can inform them of the advantages of utilizing contextualized intervention materials in the classroom, as mentioned by the study's researchers.

Scope and limitations of the Study

This study is limited to the development and validation of intervention material for teaching Physics to grade 9 learners at Jacinto D. Malimas Sr. National High School. The content, readability, usability, and level of contextualization of the material were the targets of this study. The CIM was validated by the three experts in terms of its content, readability, usability, and level of contextualization; however, the approval of the CIM by prospective student-users is only limited to its readability and usability.

Definition of Terms

The following are the terms and their operational definitions being used in the study:

Content. This refers to the quality of contextualized intervention material aligned with the science learning competencies to meet the needs of the learners.

Contextualized Intervention Material. This refers to instructional or supplementary learning material, particularly contextualized intervention material that employs relevant context to support learners mastery of different competencies.

Development. This refers to the creation of contextualized intervention material in Physics for Grade 9 Science based on the identified least learned competency.

Least Learned Competency. This refers to the least mastered skills in Science learning areas for the fourth quarter of grade 9.

Level of Contextualization. This refers to the process of presenting a lesson in contextualized intervention material in a meaningful and relevant context based on previous experiences and real-life scenarios.

Readability. This refers to the ease with which written texts can be understood.

Usability. This refers to the effectiveness, efficiency, and satisfaction with which learners can achieve specified learning goals in a particular environment.

Validation. This refers to the accuracy or correctness of the Science concepts (content) as presented in the proposed contextualized intervention material. The accuracy of the Science concept is judged in terms of the proposed contextualized intervention material's content, readability, usability, and level of contextualization. The Science Content Expert who assessed the entire CIM makes judgments about the validity of the contextualized intervention material presented.

CHAPTER 2

REVIEW OF LITERATURE

This chapter presents the contents of several books, theses, dissertations, and other primary sources that the researcher used to gather relevant data for the study.

Learning Competency in Science

The K–12 Curriculum Guide in Science 2013, cited by Pacquing (2020), emphasized that the objective of the science curriculum is to produce scientifically literate citizens who are informed and active members of society, responsible decision-makers, and apply scientific knowledge that will significantly impact society and the environment. In particular, the science curriculum was created to broaden the pupils' knowledge in three domains. According to Suarez et al. (2020), because of how quickly society is evolving nowadays, the educational system must meet training criteria in order to produce competent graduates. Thus, in order to prepare students for success in a world where globalization rules, they must acquire certain fundamental scientific abilities throughout their time in school, such as the study and interpretation of data through observation, along with a basic understanding of physics.

According to Liu et al. (2020), the collective performance of physics' educational value, critical thinking skills, and the necessary learning style of

students should gradually evolve during the course of receiving physics education in order to match the student's lifelong growth and society's demand for the essential competences of physics in curriculum standards. Because they are the key elements that make up a student's ‘scientific literacy.’

Moreover, the Department of Education emphasized the need for students to be educated and equipped with knowledge and abilities in problem-solving, information interpretation, and the capacity to seek and assess evidence in order to reach judgments. The ability of students to measure and compare things helps them become more literate in science and develop skills across the curriculum. These skills, which include observing, researching, describing, making predictions, and experimenting, are important not only for scientific thinking but also for academic success in general. The lessons learned in school are applicable to the real world (Mississippi College, 2021).

According to Usmeldi (2018), in order to accomplish the learning objectives of physics, the teacher must incorporate exploratory activities and experiments. He emphasized that teaching materials are one of the things that help students succeed in learning physics. The effectiveness of the learning process in physics courses is significantly influenced by the instructional materials. Teachers are intended to help pupils develop the required competence in the subject of physics.

Additionally, educators are working to assist students in coping with learning competencies, particularly in our present educational environment, by developing intervention materials. It is important for teachers to create

intervention materials as part of their teaching tactics to improve the students' least-mastered skills in the specific subject area; this will assist students in developing competencies that they did not master during regular courses (Cordova et.al 2019). Furthermore, it is impressive that the teacher developed teaching materials to assist the pupil in their academic achievement. Because of the beneficial information exchange between the student and teacher made possible by the availability of this instructional material, learning can be enjoyable (Quisumbing et al.2017). Dy (2011) claims that intervention materials are highly valued as instruments in the Philippine educational system for improving students' subpar academic performance (Suarez et al., 2020).

As stated by de Jesus (2019) in his study on enhancing the least-mastered abilities in Science 9, utilizing the "Pump it up! He emphasized in his study that the Department of Education's goal of ensuring that no student is left behind is achieved through the use of electronic strategic intervention material. Every student is given the same opportunity to develop at their own rate through contextualization and differentiated learning instructions, enabling teachers to support students' capacity for learning to become concrete.

According to UNESCO (2006), the Department of Education has been dealing with inadequate books. As a result, the intervention has become an essential tool for teachers to ensure that all students succeed in high-stakes testing environments, as indicated by Casilla et al. (2021).

On Phases of CIM Development and Validation

The Department of Education suggested creating intervention materials as a sort of remediation to raise the students' level of science proficiency. According to Cordova et al. (2019), in order to address learners' needs through instruction and remediation, teachers were educated to create and apply strategic intervention material. As specified by Alair (2020), to entice many teachers to use the strategic intervention materials in the teaching-learning process, the designs must be appealing and eye-catching. He continued by saying that the advantages of the strategic intervention materials extend beyond the convenience of the teacher and the educational system to the students' simple comprehension.

To ensure that generated instructional materials are valid and effective in meeting learning criteria, many researchers have established norms and guidelines. Luzano (2020) developed and validated strategic intervention materials (SIMs) for the senior high school trigonometry course using the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) phase. He modified the paradigm so that the conceptualization, planning, and analysis phases were involved in the development of the study's strategic intervention material. The least-mastered competencies were determined based on the Pre-Calculus final exam scores. The design and development of the SIM, the selection of the appropriate format, and other crucial elements were all addressed at this stage of development. The presentation and consultation of intervention materials with the thesis advisor, peers, and SIM designers were the

main objectives of the implementation stage. The content of the produced SIMs was evaluated during the validation stage based on its design, readability, importance, suitability of the activities, ease of task completion, chances for active learning, and usefulness in satisfying the needs of the learners.

Comments and suggestions by the content and student validators were part of the validation stage for further improvement of the materials. The validation stage included comments and recommendations from the content and student validators for additional material improvement. According to the Luzano study, teachers should create more SIMs for other subjects to help students who are having trouble learning trigonometry. His research suggested that the content-validators viewed the SIMs as learner enhancers and teacher support items that might be used to help students understand Precalculus competencies. This researcher's model is comparable to Cubillas (2018) work on the "Development and Validation of the Usability of Strategic Intervention Materials (SIMs)," who modified ADDIE model-based stages for creating strategic intervention materials. Her research found that usability experts saw SIMs as teacher-supplemental materials that might be used to master the primary English 4 competencies. In order to address the least taught competencies, it is advised that teachers create more strategic intervention resources for different learning domains based on the study's findings.

Additionally, the Input-Process-Output Model of producing instructional materials was used in the work by Ladia (2019) on the Development and Validation of Strategic Intervention Materials (SIMs) Using Synectics in 7th grade

Physics. The K–12 Curriculum Guide and instructions established by the Department of Education for creating SIMs served as the components of input for the SIMs. She follows a three-step process, starting with SIM preparation (content selection based on least-practiced skills), moving on to SIM development (actual writing, production, proofreading, editing, and initial revision), and ending with SIM validation (first and second pilot testing of the edited SIM with 60 7th grade students). The SIMs were verified by the five chosen experts following the pilot test. Her research showed that, with regard to the technical, pedagogical, and content components of SIMs, the expert replies were very consistent. Her study's findings imply that the SIM is simple to read and appropriate for 7th grade students. The researcher's method is similar to the one utilized by Lazo et al. (2021), who adapted the stages in developing strategic intervention materials to go through three phases: the planning phase, the development phase, and the validation and evaluation phase. Their research showed that students' academic performance in Economics prior to using the strategic intervention material was not up to par or equitable. However, after using SIM, the same group of students' economics performance was satisfactory. Based on the evaluation by the experts (educators-evaluators), it was discovered that the content, structure, and usability composition of the study material's acceptability and utility were extremely obvious.

On Contextualized Intervention Material

Section 5 of Republic Act 10533, the 2013 Enhanced Basic Education Act, states that curricula must be adaptable enough to enable schools to localize,

indigenize, and improve them in accordance with their unique educational and social contexts. Contextualization is the educational practice of connecting the curriculum to a place, circumstance, or area of application in order to make the competences suitable, meaningful, and advantageous to all learners, according to DepEd Order No. 32 series of 2015. Localization, on the other hand, describes the process of connecting curriculum-specified content to regional data and resources found in the learner's surroundings or community. It also intends to direct educational institutions and other initiatives as they collaborate with indigenous communities to contextualize K–12 curricula (Amar, 2019).

According to Policarpio (2018), localization is a branch of contextualization in which teachers create instructional materials based on local knowledge, resources, language, and culture. In accordance with DepEd Order No. 32 series from 2015, contextualization is the educational practice of linking the curriculum to a place, circumstance, or area of application in order to make the competences appropriate, meaningful, and beneficial to all learners. On the other hand, localization refers to the act of integrating regional data and resources found in the learner's surroundings or community—specifically, the local environment of the learners—with curriculum-specified content. Additionally, the K–12 curriculum emphasizes the important role that extracurricular activities and community involvement play in the learner's overall development. Real chances for contextualized learning are here. The extracurricular activities and community service programs give students the chance to expand on what they learn in class and put their newfound knowledge and abilities to use.

As stated in DepEd Order No. 21, s. 2019, in response to RA 9155, the Governance of Basic Education Act of 2001, which states, "The State shall support local efforts to raise the standard of basic education, The state is responsible for ensuring that the educational program for children, young people who are not in school, and adults reflects the values, needs, and goals of the school community. Schools are encouraged to localize the curriculum to address the needs of teaching and learning, and they can similarly enrich the curriculum without sacrificing the established content and performance standards and competencies to make the curriculum responsive to their needs. Schools and learning centers shall be empowered to make decisions on what is best for the learners they serve.

Furthermore, having localized materials implemented or adopted in our educational system has numerous benefits, as indicated by Dimacali (2018), including the following: First, it will raise knowledge of the status of a particular issue under discussion or of current events. Second, because it is more specific and closely tied to us, it will give the pupils the confidence to learn more because they are already familiar with it. By using contextualized and localized materials in the intervention, teachers' inventiveness and creativity will be fostered. According to Posadas (2019), creating instructional materials for teaching classes should inspire students to show an interest in carrying out related tasks in a real-world setting and should be adaptive to their level of knowledge.

Moreover, Viado et al. (2019) asserted that the creation of contextualized and locally tailored intervention materials was successful in raising the academic

performance of Science students in grade 5. In the same way, it improved their memory capacity, and made teaching and learning fun. In response to this issue, the Bureau of Secondary Education (BSE) has released Memorandum No. 117 s. 2005. To improve teachers' abilities in test analysis and interpretation, Strategic Intervention Materials (SIMs) training sessions were conducted. This will also enable teachers to create different intervention materials for remediation and enrichment. SIMs were employed as one of the designated instructional tools to address the country's deteriorating educational system and the performance of the secondary schools, precisely as presented (Adonis, 2020).

Additionally, the strategic intervention materials ensured that the activities were in line with the learning objectives and competencies, that they were short and simple, and that a variety of activities were available to suit the needs of different types of learners. By giving students a variety of activities, they can have adequate time to practice learning the skill and concentrate on the competencies that they have not yet mastered.

As stated by DepEd Memorandum No. 89 Series of 2020, The MELCs (Most Essential Learning Competencies) are to be used by schools when developing learning activity sheets, self-learning modules, and other instructional resources. For all schools, school division offices, and regional offices to choose and execute learning delivery strategies that are appropriate for the local context and diversity of learners while adjusting to the challenges brought by COVID-19, DepEd supplied the MELCs as the primary reference.

According to Mazzeo, as cited by Rivera et al. (2020), the purpose of contextualization is to effectively connect the knowledge and abilities that students have learned about real-world applications in their daily lives. They acquire not only the subject matter but also the application skills and metacognitive awareness of when and how to use what they have learned through this. This statement was supported by Bringas, as mentioned by Garin et al. (2017), that localization and contextualization are possible in all learning domains and will maximize activities since resources are easily accessible locally. The context of learners' lives must be used by teachers to ground instruction.

According to Castillo (2019), adopting localized resources in our educational system has a number of benefits that can be used across all subject areas. Localized and contextualized curricula provide for class flexibility and innovation. When students learn how to apply the concept in a practical setting, this will also increase their interest in their academic work. It will encourage students to learn more about their own cultural history and help them comprehend and value other cultures' cultural legacies.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the research design, participants of the study, research locale, research instrument, data gathering procedure, scoring and quantification of data.

Research Design

The descriptive-developmental research approach was used for this study. It is both descriptive and developmental in the sense that it determined the least-learned competency in Grade 9 Science for the academic year in the area of Physics and sought to create or develop contextualized intervention material to help low-performing students in Science. Additionally, this study takes into account the opinions of experts in science content and pedagogy regarding the validity of CIM.

Research Locale of the study

The researcher created contextualized intervention material based on the identified least learned competencies that were revealed by the item analysis of the fourth quarter assessment taken from the combined four (4) sections of grade 9 with a total population of 141 students at Jacinto D. Malimas Sr. National High School for the academic year 2021–2022. Jacinto D. Malimas Sr. National High School is one of the public schools in the Gingoog City Division. It is located at Purok 2, Brgy. Odiongan, Gingoog City, and is almost 9 kilometers away from the

city proper, and was established in 1966. It has almost 1,000 enrollees and a population of 38 teaching personnel and 1 non-teaching personnel.

Figure 2

Map of the Setting of the Study

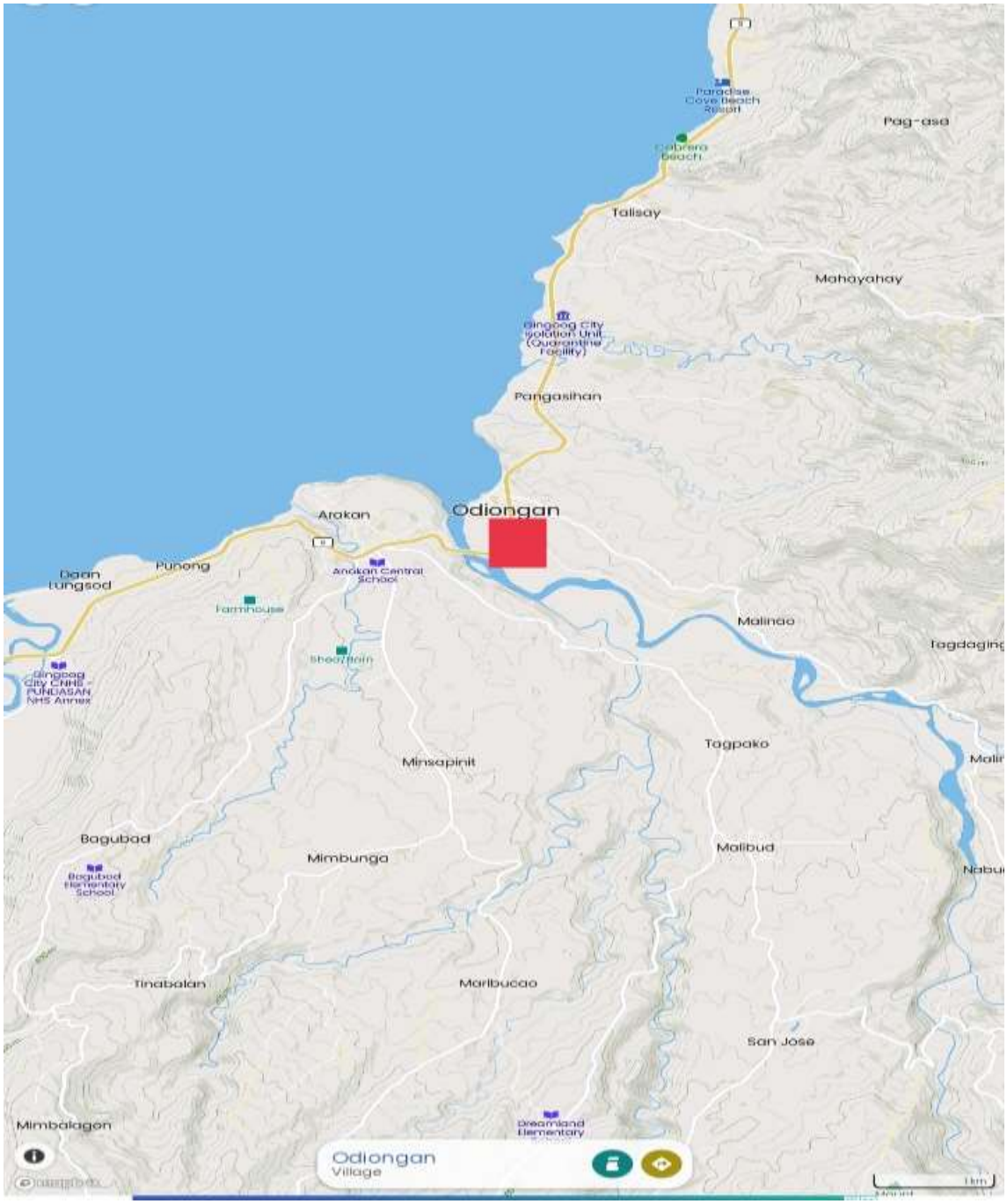

Figure 2. A Map of Brgy. Odiongan, Gingoog City, Misamis Oriental where Jacinto D. Malimas Sr. National High School is located, is the locale of the study.

Participants/ Respondents of the Study

The participants of this study consisted of two (2) Master Teachers, one (1) Supervisor in science, and ninety (90) prospective student-users. The three chosen validators have backgrounds in science. They verified the content, readability, usability, and contextualization degree of the CIM. The three experts have been teaching science for more than five (5) years and have attended numerous training sessions and conferences regarding the creation of instructional learning materials. Moreover, the prospective student users, learners from Jacinto D. Malimas Sr. National High School, validated the materials in terms of readability and usability.

Sampling Design

The researcher used the purposive sampling technique in the selection of three (3) experts from the Department of Education (DepEd) and ninety (90) prospective student-users from JDMSNHS who validated the Contextualized Intervention Material (CIM) as an aid in teaching Junior High School Physics to address the least learned competencies in the fourth quarter of science for grade 9 learners.

Research Instruments

In identifying the least learned competency, the researcher used the fourth quarter examination test questionnaire (TQ) intended for grade 9 learners. The test questions were aligned with the Most Essential Learning Competencies (MELCs). The questions were constructed based on the table of specifications

and were reviewed and checked by the Science Department Coordinator and the School Principal of Jacinto D. Malimas Sr. National High School. The item analysis showing the difficulty index served as the basis for identifying the least learned competency in the fourth quarter of Science in the area of Physics.

On evaluation and validation of contextualized intervention material, the developed material was validated using the criteria specified in DepEd Memorandum No. 225, series of 2009, on SIM-making contest. The researcher adapted and modified the criteria from DM 225, s. 2009, in making survey questionnaires and added an evaluation rating on a numerical and descriptive four-Likert scale to regulate the weak and strong areas indicated in the criteria. Spaces at the end of the criteria for evaluation are also provided for the expert's comments and suggestions.

Validation of Research Instruments

The researcher modified and adapted the instrument from the criteria for Science Intervention Material (SIM) in DepEd Memorandum No. 225, series of 2009, and criteria set by DepEd Guidelines and Processes for LRMDS Assessment and Evaluation. The three experts in the field of Science validated the instruments based on the rating scale shown in Table 1. After the content and face validation from the experts, the instruments were used to evaluate the contextualized intervention material, which was developed by the researcher as an aid to address the least learned competency in Grade 9 Science in the field of Physics.

Table 1

Rating Scale on the Validation of the Research Instrument (CIM) Evaluation Form

Rating Scale	Descriptive Meaning
5	the criteria exceed expectations (no modification needed)
4	the criteria meet expectations (no modifications needed)
3	the criteria meet expectations (no modification needed but could be improved by minor changes)
2	the criteria are below expectations (some modifications or revisions are needed)
1	the criteria are not acceptable (discard)

Data Gathering Procedure

The study undertaken in five phases adopted the ADDIE model of instructional design, which includes the analyzing phase, designing phase, developing phase, implementing phase, and evaluating phase.

The Analyzing Phase. At this stage, the researcher consolidated the item analysis of the four sections from the results of the fourth quarter examination in grade 9. The item analysis of the said examination was made to identify the least learned competency based on DepEd Memorandum No. 160, series of 2012 Mastery/Achievement Level, or MPS. A percentage rating of 96–100% indicates mastery, 86–95% as closely approximating mastery, and 66–85% as moving towards mastery. 35–65% as average, 15–34% as low, 5–14% as very low, and 0-4% as absolutely no mastery. The least learned competency was specified and served as the basis for choosing, drafting, and contextualizing the activities for the strategic intervention material. The least learned competency being identified based on the K-12 Curriculum Guide of Most Essential Learning Competencies

(MELCs) was to "Describe the horizontal and vertical motions of a projectile" and has a code of *S9FE-IVa-34*. This competency was identified as the least learned among all the competencies as it falls to a low mastery level. This determined competency was the basis for conceptualizing activities, tasks, and assessments upon CIM development.

The Designing Phase. The researcher considered the layout of the cover page, the graphics to be used, the design of the CIM, the adoption of the format, and the instructional model to be used. Contextualization of the selected activities, assessment, and enrichment were also included at this stage. The contextualized intervention material was designed into the following parts: a title card, a guide card, an activity card, an assessment card, an enrichment card, an answer key card, and a reference card.

The Developing Phase. The concrete making of the contextualized intervention material was included in this phase. The identified least learned competency was the basis for the activities, sub-tasks,and assessments. The first draft of CIM was developed at this stage and underwent informal validation as suggestions and comments were solicited from the adviser and the researcher's colleagues.

The Implementing Phase. After the suggestions and advice were applied, the contextualized intervention material was presented to the experts for consultation to determine the areas that were outstanding and needed improvement. Comments and suggestions from experts in the field of Science were also considered, as space for comments was provided on the evaluation instrument.

The Evaluating Phase. In this phase, the contextualized intervention material underwent formal validation. The three experts validated the CIM in terms of content, readability, usability, and level of contextualization using the modified and adapted criteria set by the DepEd in evaluating and judging strategic intervention material. However, the prospective student-users validation of the material limits itself to readability and usability. The validators comments, suggestions, and recommendations were considered upon the finalization and revision of the contextualized intervention material.

Upon approval of the thesis proposal by the Thesis Evaluation Committee, the researcher asked permission through a permit letter from the School Division Superintendent to conduct the study. The researcher brought the signed permission letter from the School Division Superintendent personally to the three experts, composed of two Master Teachers and a supervisor in Science. The researcher presented the contextualized Intervention material to the three experts and to the prospective student users for validation. Figure 3 shows the flowchart of the different phases in developing the contextualized intervention material.

Figure 3

Flowchart of the Development of Contextualized Intervention Material

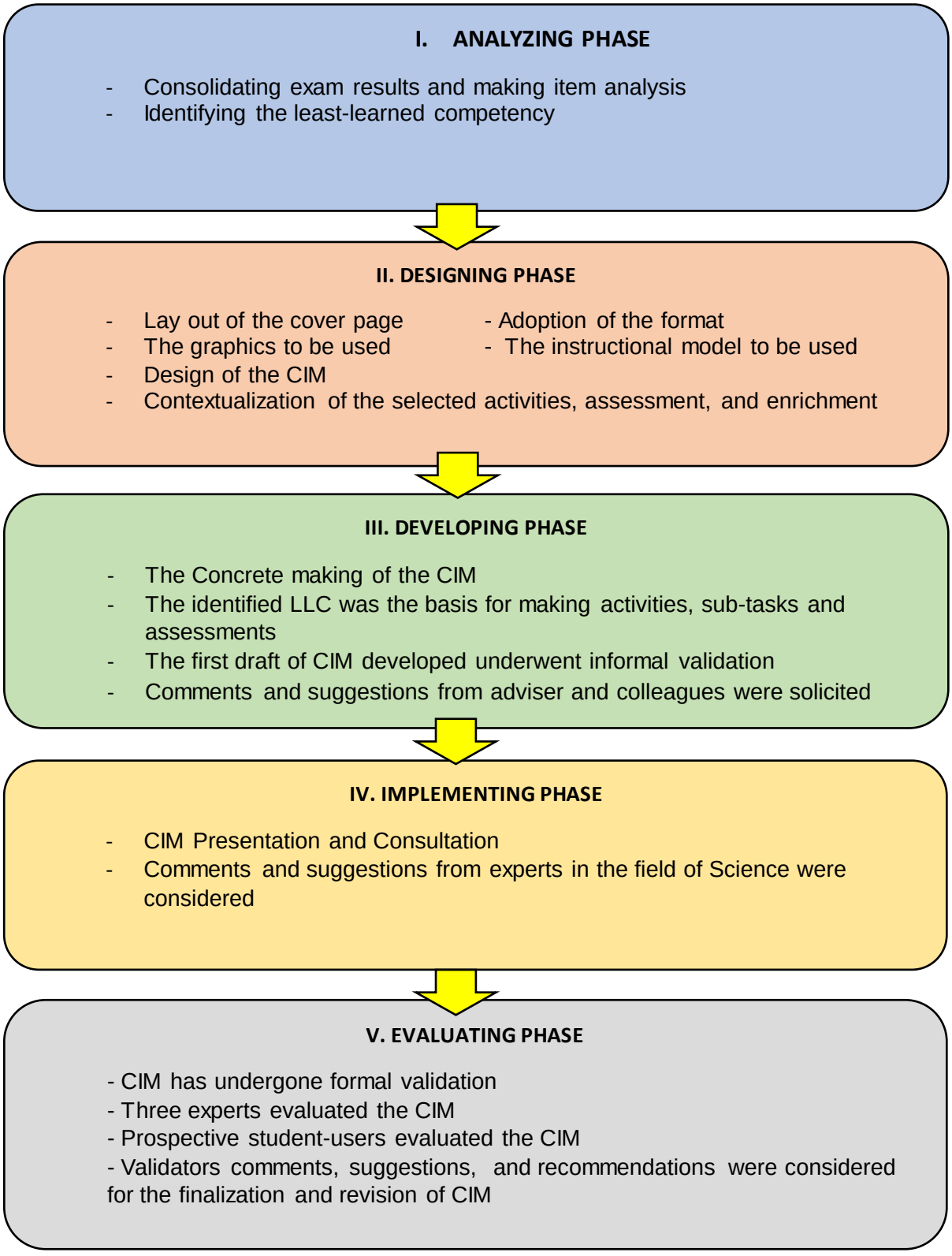

Figure 3. Flowchart of the Development of Contextualized Intervention Material Inspired by the ADDIE Model, which was originally invented by Florida State University in 1975

Scoring and Quantification of Data

The item analysis of the results in the four assessments conducted on the combined four (4) sections of the grade 9 students in Jacinto D. Malimas Sr. National High School was used to determine the Mean Percentage Scores (MPS) based on DepEd Memorandum No. 160, series of 2012. The MPS of each competency was computed and interpreted based on DM No. 160, the series of 2012 mastery and achievement levels, as shown in Table 2.

Table 2

Department of Education Mastery/ Achievement Level

MPS	Descriptive Equivalent
96-100%	Mastered
86-95%	Closely Approximating Mastery
66-85%	Moving toward Mastery
35-65%	Average
15-34%	Low
5-14 %	Very Low
0-4%	Absolutely No Mastery

Table 2: Mastery and Achievement Levels used for the interpretation of MPS results and their descriptive equivalents for data utilization (e.g., intervention, remedial instruction, etc.) as stipulated in DM No. 160, s. 2012

Table 3

Likert Four-Point Scale Range Interpretation

POINT	SCALE RANGE	VERBAL DESCRIPTION	INTERPRETATION
4	3.50-4.00	Strongly Agree	Excellent
3	2.50-3.49	Agree	Very good
2	1.50-2.49	Disagree	Good
1	1.00-1.49	Strongly Disagree	Poor

Table 3 shows the Likert four-point scale range in the evaluation form and assessment survey questionnaire used to interpret the data derived from the validation of the contextualized intervention material evaluated by the three experts and prospective student-users.

Statistical Treatment

The data collected from the validation of the three experts who specialized in Science and prospective student-users was computed through the weighted mean rating per item, and the overall weighted mean rating is included in the computation.

CHAPTER 4

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter comprises the presentation, analysis, and interpretation gathered in this study.

1. Developed Contextualized Intervention Material

The contextualized intervention material developed was based on the least learned competency of Grade 9 Science, guided by the DepEd K–12 Curriculum Guide of Most Essential Learning Competencies (MELCs).

Table 4

Least Learned Competency Used as Bases for CIM Development

Least Learned LC Code	Least Learned Competency	CIM Title
S9FE-Iva-34	Describe the horizontal and vertical motions of a projectile.	Contextualized Intervention Material in Science 9 (Projectile Motion)

Among the seven (7) Learning competencies for the fourth quarter in Science 9, one was identified as the least learned competency under the topic belonging to the "low mastery" level stipulated on the DepEd Memorandum No. 160, series of 2012. By getting the Mean Percentage score, or MPS, the least learned competency of each topic was identified, as shown in Table 4.

Comments and Suggestions for the developed contextualized intervention material in Science 9 (Projectile Motion) as presented in Table 5 by the

researcher's adviser and colleagues for the first draft and the expert for the second draft were pursued and followed.

Table 5

Comments and Measures Taken for the Contextualized Strategic Intervention Material

Comments/Suggestions	Measures Taken
Graphics embedded ought to relate to projectile motion (title card)	Added graphics about projectile motion in title card
Instead of describe use "define" (guide card)	Word describe corrected into "define"
Contextualize Pre-assessment numbers 2, 5, 6, 7, 8 and 10 (Activity Card)	Items 2, 5, 6, 7, 8 and 10 in pre-assessment were contextualized.
Modify Activity Cards 2 and 4	Activity cards 2 and 4 were modified
"For number 1-3" change into "For numbers 1-3" (Enrichment Card)	Instruction was corrected from "for number 1-3" to "for numbers 1-3"
Contextualize No. 2 (Enrichment Card)	Item number was contextualized
For no. 3 "clarify what (X) stands for (Enrichment Card)	Item no. 3 question was rephrased and emphasized that (X) stands for horizontal distance
Do not fill any color, rectangular boxes (Title Card and the rest of the card)	Title rectangular box color removed and other rectangular boxes in different cards
Lesson title must be bigger than least learned competency (Title Card)	Increased the font size of lesson title and reduced the font size of LLC
Please revise "Identify the choice " to choose the letter that … (Activity Card)	Directions revised
Choices must be CAPSLOCK (A, B, C, D), observe alignment of choices	Letter choices were CAPSLOCK and alignment of choices were observed

The contextualized intervention material is composed of seven (7) parts called cards, which were rooted in DepEd Order 225, series of 2009. The contextualized intervention material focused on the least learned competency, "describe the horizontal and vertical motion of a projectile," with the code S9FE-Iva-34. The Title Card shows the contextualized intervention material title, which is "Projectile Motion". The Title Card also presented the least learned competency need to be addressed, which the CIM intended to use. Graphics related to projectile motion were placed by the developer to stimulate the interest of the learners and give a bird's-eye view of the topic. Next to the Title Card is a table of contents showing all parts and contents of the CIM. Before the Title card, the researcher should also acknowledge the validation of the material by presenting the certificate of validation as proof that the material has been validated by experts in the field. This is followed by the page showing the purpose and how to use the CIM.

The second card of the CIM is the Guide Card; this card poses information related to the lesson or activities that the learners may ponder before using the contextualized intervention material. Next is the activity card. The researcher presented four Activity Cards that correspond to the least learned competency; all the activities on the card used different teaching and learning strategies. After the Activity Card is the Assessment card, which aims to measure the learning of the students based on the activities they performed on the previous cards. The Enrichment Card follows the Assessment Card; these are additional activities to extend learning. The answer card is next to the enrichment card, where learners

can refer after performing and accomplishing all the activities in the previous cards. The last card is the Reference Card that shows different sources, which are composed of bibliographies, internet websites, and books in Science.

Furthermore, the CIM was integrated with an activity that used contextualized material like a popsicle stick and other material readily available in the environment to make a catapult as part of a performance task to describe the horizontal and vertical motion of a projectile.

2. Validation of the Contextualized Intervention Material by the Expert

The experts in the field of Science in terms of the following areas validated the developed contextualized CIM: (1) Content; (2) Readability; (3) Usability and (4) Level of Contextualization.

The mean distribution of the validation of Contextualized Intervention Material on "Projectile Motion" in terms of content is illustrated on the Table 6.

Table 6

Experts' Evaluation of the Contextualized Intervention Material in terms of Content

Particulars	Wtd Mean	Std. Deviation	Verbal Description	Interpretation
1.The title was short and catchy.	4.00	.000	Strongly Agree	Excellent
2. Title was significantly related to the competency being measured.	3.67	.577	Strongly Agree	Excellent
3.Words used were simple and suitable for learners.	3.67	.577	Strongly Agree	Excellent
4.Sentences were grammatically correct.	3.67	.577	Strongly Agree	Excellent
5.Activities were appropriately designed to the level of the students.	3.67	.577	Strongly Agree	Excellent
6.Activities were paralleled to the least learned competency and sub tasks.	3.67	.577	Strongly Agree	Excellent
7.Assessments were appropriately designed to the level of the students.	3.33	1.155	Agree	Very Good
8.Assessments were paralleled to the least learned competency and sub-tasks.	3.67	.577	Strongly Agree	Excellent
9.Enrichments were appropriately designed to the level of the students.	3.67	.577	Strongly Agree	Excellent
10.Enrichments were paralleled to the least learned competency and sub-tasks.	3.67	.577	Strongly Agree	Excellent
11.Sources are properly cited.	4.00	.000	Strongly Agree	Excellent
12.Sources are relevant to learning competency.	4.00	.000	Strongly Agree	Excellent
Overll Weighted Mean	3.72	.479	Strongly Agree	Excellent

Legend: 1.00-1.49-Strongly Disagree/ Poor; 1.50-2.49-Diagree/Good 2.50-3.49-Agree/Very Good; 3.50-4.00-Strongly Agree/ Excellent

As manifested from the table, the highest mean ratings of the field experts for the contextualized intervention material on Projectile Motion in the focus area of content were given on items 1, 11, and 12 with a weighted mean of 4.00, interpreted as excellent," and a standard deviation of.000. Whereas the lowest is item 7, with a weighted mean of 3.33, interpreted as "very good," and a standard deviation of 1.155. This revealed that the CIM on Projectile Motion was found competency-based by the experts and encloses activities and assessments that are in line with content and skills with an overall weighted mean of 3.72 and a descriptive title of "excellent". This implied that the content-validators considered the material as teacher support that can be used to improve and enhance learners' competence (Luzano, 2020).

The mean distribution of the validation of the developed CIM on "Projectile The mean distribution of the validation of the developed CIM on "Projectile Motion" in the focus area of readability as validated by the experts is presented in Table 7. It shows that the highest mean ratings were given to items 7, 8, and 11, with the same weighted mean of 4.00 and a standard deviation of.000. The lowest mean rating was given to item 10, with a weighted mean of 3.33 and a standard deviation of.577, which is interpreted as "very good". The results showed that the experts found the contextualized intervention material to be excellent in terms of readability, meaning that written text can be easily understood by the learners. This can be observed from the table below, where the overall weighted mean in this area is 3.70, which is interpreted as "excellent". This can be supported by Alair's (2020) study, which found that in order to

encourage many teachers to use strategic intervention materials in the teaching and learning process, the designs must be attractive and eye-catching.

Table *7*

Experts' Evaluation of the Contextualized Intervention Material in terms of Readability

Particulars	Wtd Mean	Std. Deviation	Verbal Description	Interpretation
1. Texts are presented accurately and closely.	3.67	.577	Strongly Agree	Excellent
2. Size and format of print is appropriate.	3.67	.577	Strongly Agree	Excellent
3. Attracts the reader significantly.	3.67	.577	Strongly Agree	Excellent
4. Least learned competency is clearly stated.	3.67	.577	Strongly Agree	Excellent
5. Directions were clearly stated and understandable to the students.	3.67	.577	Strongly Agree	Excellent
6. Activities and task arranged logically.	3.67	.577	Strongly Agree	Excellent
7. Directions were clearly stated and understandable to the students.	4.00	.000	Strongly Agree	Excellent
8. Vocabulary used in assessment is appropriate to the student's grade level.	4.00	.000	Strongly Agree	Excellent
9. Directions were clearly stated and understandable to the students.	3.67	.577	Strongly Agree	Excellent
10. Clearly provides activities that reinforce the content of the lesson.	3.33	.577	Agree	Very Good
11. Language used were simple and easily be understood by the students.	4.00	.000	Strongly Agree	Excellent
12. Students may be referred to further reading.	3.33	.577	Agree	Very Good
Overll Weighted Mean	3.70	.387	Strongly Agree	Excellent

Legend: 1.00-1.49-Strongly Disagree/ Poor; 1.50-2.49-Diagree/Good 2.50-3.49-Agree/Very Good; 3.50-4.00-Strongly Agree/ Excellent

For the validation of contextualized intervention material in terms of usability, as depicted in Table 8, the three experts have almost given the same ratings to the area of content, only varying in their suggestions for improvement. The highest weighted mean was given to 2, 3, 4, 9, and 10, with a perfect mean score of 4.00 interpreted as "excellent" and a standard deviation of.000. The lowest weighted mean of 3.00 was given to item 8, which is interpreted as "very good". The overall weight in the focus area of usability is 3.70, with the descriptive title "excellent". This demonstrated that the contextualized intervention material on projectile motion was prepared in accordance with Bloom's taxonomy and was recognized by experts as instructional material. It contains cards with lessons and activities that can help students with their least-taught skill in Physics. In the study by Cubillas (2018), usability experts believed that strategic intervention materials could potentially be used by teachers to help students improve their competence.

Table 8

Experts' Evaluation of the Contextualized Intervention Material in terms of Usability

Particulars	Wtd Mean	Std. Deviation	Verbal Description	Interpretation
1. Title was enticing to the students to use it.	3.67	.577	Strongly Agree	Excellent
2. Title is accurate and well-integrated into the material.	4.00	.000	Strongly Agree	Excellent
3. Guide title and statements were enticing to the students.	4.00	.000	Strongly Agree	Excellent
4. Guide students on how to use the CIM.	4.00	.000	Strongly Agree	Excellent
5. Activities were designed to measure to its truest objectives.	3.67	.577	Strongly Agree	Excellent
6. Provide examples to concretize the concepts.	3.33	.577	Agree	Very Good
7. Assessments were designed to measure to its truest objectives.	3.67	.577	Strongly Agree	Excellent
8. Provides exercises, drills and activities that allow students to assess their understanding of what they have learned.	3.00	.000	Agree	Very Good
9. Enrichments were designed to strengthen conceptual understanding.	4.00	.000	Strongly Agree	Excellent
10. Enrichments were designed to extend learning by providing exercises for further application of knowledge.	4.00	.000	Strongly Agree	Excellent
11. Answer's key was stipulated for quick reference of the students for correcting their answers	3.67	.577	Strongly Agree	Excellent
12. Students may be referred to further reading**.**	3.67	.577	Strongly Agree	Excellent
Overll Weighted Mean	3.72	.128	Strongly Agree	Excellent

Legend: 1.00-1.49-Strongly Disagree/ Poor; 1.50-2.49-Diagree/Good 2.50-3.49-Agree/Very Good; 3.50-4.00-Strongly Agree/ Excellent

Table 9.

Experts' Evaluation of the Contextualized Intervention Material in terms of level of Contextualization

Particulars	Wtd Mean	Std. Deviation	Verbal Description	Interpretation
1. The title was relevant to learner's learning environment.	4.00	.000	Strongly Agree	Excellent
2.Title was significantly contextualized.	4.00	.000	Strongly Agree	Excellent
3. Gives a preview of what the students will learn.	3.67	.577	Strongly Agree	Excellent
4. Presents the focus skill.	3.67	.577	Strongly Agree	Excellent
5. Provides localize activities that are organized based on listed competencies/ topics.	3.33	.577	Agree	Very Good
6. Provide activities that use materials that are readily available in the environment to allow students to formulate ideas on their own.	3.33	1.155	Agree	Very Good
7. Provides exercises, drills, and activities that allow students opportunities to explore the world around them.	3.67	.577	Strongly Agree	Excellent
8. Formulates in standard test formats to give students practice in authentic test-taking techniques.	3.67	.577	Strongly Agree	Excellent
9. Provides opportunities for the students to apply what they have learned.	3.00	.000	Agree	Very Good
10. Provides opportunities for the students to work independently or in group to explore answers or in new contexts.	4.00	.000	Strongly Agree	Excellent
11. Provides carefully researched list resources that will reinforce concepts and skills learned.	4.00	.000	Strongly Agree	Excellent
12. Provide additional content not found in the textbook.	3.67	.577	Strongly Agree	Excellent
Overall Weighted Mean	3.67	.364	Strongly Agree	Excellent

Legend: 1.00-1.49-Strongly Disagree/ Poor; 1.50-2.49-Diagree/Good 2.50-3.49-Agree/Very Good; 3.50-4.00-Strongly Agree/ Excellent

Table 9 presents the mean distribution of the validation of contextualized intervention material in terms of level of contextualization given by the experts in the field of Science. As exhibited on Table 9, the highest weighted mean were

given to items 2, 8 and 9 with perfect rating of 4.00 and standard deviation of .000, which interpreted as “excellent”, and the lowest weighted mean rating was given to item 9 with 3.00 rating and standard deviation of .000, interpreted as “very good”. The over-all weighted mean in validation of contextualized intervention material in terms of level of contextualization is 3.67 with descriptive title of “excellent”. This demonstrated that the experts believed the content of the CIM to be significant and pertinent to learning. The performance tasks are genuine and support locally produced materials that are easily accessible in the surroundings. According to Viado et al. (2019), the production of localized and contextualized intervention materials was effective and will boost academic performance in science.

The summary of the overall weighted mean ratings in all areas by the experts upon validation of the contextualized intervention material is presented in Table 10.

Table 10

Summary of Over-all Weighted Mean Ratings by the Experts on Validation of Contextualized Intervention Material

Area	Over-all Weighted Mean	Standard Deviation	Verbal Description	Interpretation
Content	3.72	.479	Strongly Agree	Excellent
Readability	3.70	.387	Strongly Agree	Excellent
Usability	3.72	.128	Strongly Agree	Excellent
Level of Contextualization	3.67	.364	Strongly Agree	Excellent

3. Validation of the Contextualized Intervention Material by the Student-users

The developed contextualized intervention material, or CIM, validated by the prospective student-users was validated according to its readability and usability. The mean distribution of the CIM in terms of readability is demonstrated in Table 11. The highest weighted mean is shown in item 1, with a rating of 3.80, interpreted as "excellent" and the lowest weighted mean is given to item 3, with a rating of 3.50, also interpreted as "excellent". The overall weighted mean of 3.60 with the descriptor "excellent" merely demonstrates that students found the contextualized strategic intervention material texts to be accessible, enticing, and simple to understand. The study conducted by Ladao (2019) implied that the readability of the intervention material was easy and suitable for the students.

Table 11.

Students' Evaluation of the Contextualized Intervention Material in terms of Readability

Particulars	Wtd Mean	Std. Deviation	Verbal Description	Interpretation
1. The font size is easy to read.	3.80	.402	Strongly Agree	Excellent
2. The direction/instructions are easy to follow.	3.52	.502	Strongly Agree	Excellent
3. The lessons are easy to understand.	3.50	.503	Strongly Agree	Excellent
4. The lessons are appealing as they are related to real life.	3.53	.502	Strongly Agree	Excellent
5. Getting the correct answers to the questions and getting the task done encourages me to continue the next lesson.	3.62	.488	Strongly Agree	Excellent
Overall Weighted Mean	3.60	.304	Strongly Agree	Excellent

Legend: 1.00-1.49-Strongly Disagree/ Poor; 1.50-2.49-Diagree/Good 2.50-3.49-Agree/Very Good; 3.50-4.00-Strongly Agree/ Excellent

The validation of the contextualized intervention material for prospective student-users in terms of usability is illustrated in Table 12.

Table 12

Students' Evaluation of the Contextualized Intervention Material in terms of Usability

Particulars	Wtd Mean	Std. Deviation	Verbal Description	Interpretation
1. The vocabulary used is suitable for my level.	3.54	.501	Strongly Agree	Excellent
2. The lessons provide what I need to learn about the basic concepts on the least mastered topic in Grade 9 Science (Projectile Motion).	3.52	.502	Strongly Agree	Excellent
3. The lessons helped me understand better the basic concepts on the least learned topic in Grade 9 Science (Projectile Motion).	3.53	.502	Strongly Agree	Excellent
4. The lessons helped me develop my interest in the least learned topic in Grade 9 Science (Projectile Motion)	3.46	.501	Agree	Excellent
5. The lessons helped me develop my analytical skills in doing the different activities about the least learned topic in Grade 9 Science (Projectile Motion).	3.57	.520	Strongly Agree	Excellent
Overall Weighted Mean	3.52	.344	Strongly Agree	Excellent

Legend: 1.00-1.49-Strongly Disagree/ Poor; 1.50-2.49-Diagree/Good 2.50-3.49-Agree/Very Good; 3.50-4.00-Strongly Agree/ Excellent

As shown in Table 12, in the mean distribution of the validation of contextualized intervention material made by the prospective student-users, the highest weighted mean was given to item 4, with a 3.57 interpreted as excellent, and the lowest was item 4, with a weighted mean of 3.46 interpreted as "very good" . The overall weighted mean of the contextualized intervention material in terms of usability is 3.52, with a descriptive title of "excellent". This demonstrates

that the contextualized intervention material was well received by students. The material proved to be a helpful and effective tool for future students to achieve their educational objectives. According to the research done by Lazo et al. in 2021, the academic performance of the same group of students improved from "did not meet the expectation" to "satisfactory" with the use of strategic intervention material.

Table 13

Summary of the Over-all Weighted Mean Ratings by the Prospective Student-users on Validation of Contextualized Intervention Material

Area	Over-all Weighted Mean	Standard Deviation	Verbal Description	Interpretation
Readability	3.60	.304	Strongly Agree	Excellent
Usability	3. 52	.344	Strongly Agree	Excellent

Table 13 presented the summary of the over-all weighted mean ratings by the prospective student-users upon validation of developed contextualized intervention material.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to create and evaluate contextualized intervention material for Jacinto D. Malimas Sr. National High School Grade 9 Science class in physics.

Based on the item analysis from the results of Science fourth quarter summative assessment the least learned competency determined as follows: “describe the horizontal and vertical motions of a projectile” out of seven learning competencies of MELCS. The learning competency falls to mastery level of 34 % with a descriptive equivalent of “low mastery” based on DepEd Memorandum No.160, series of 2012. Upon identifying the least learned competency the researcher developed the contextualized intervention material that containing cards as required in DepEd Order 225, s. 2009.

In terms of the focus areas listed in the instruments, the contextualized intervention material was validated and graded by experts and potential student users. The material's validators also provided written comments and ideas for minor editing and enhancement. The evaluation showed that the three experts gave the contextualized intervention material created by the researcher an "excellent" overall descriptive rating in terms of content, readability, usability, and level of contextualization. Additionally, the information was assessed by potential

student users in terms of readability and usability, earning the overall descriptive rating of "excellent".

Findings

These are the remarkable findings extracted from the study:

1. The study showcased the exceptional quality of the CIM devised by the researcher. It was thoroughly evaluated by a content and pedagogy expert who assessed its content, readability, usability, and level of contextualization. The expert bestowed the CIM with an overall descriptive rating of "excellent." Additionally, they provided insightful comments and valuable suggestions for further enhancing the material's quality.
2. The CIM underwent an evaluation process involving prospective student users, who appraised the material for its readability and usability. The outcome of this evaluation was immensely positive, as the CIM garnered an overall descriptive rating of "excellent" in both categories.

These findings unequivocally establish the exceptional nature of the CIM, highlighting its excellence in terms of content, readability, usability, and contextualization. The positive evaluations received from the content and pedagogy experts, as well as the prospective student users, underline the material's effectiveness and potential for enhancing the educational experience.

Conclusions

In consideration of the findings, the following conclusions have been drawn:

1. The contextualized intervention materials have demonstrated their acceptability and suitability for utilization as scaffolding tools to assist students in attaining specific learning objectives. The materials effectively provide the necessary support to enhance students' understanding and mastery of the subject matter.

2. The reliability of the contextualized intervention material has been established, indicating its potential to be a valuable resource for students encountering difficulties with the projectile motion topic in their physics classes. The material effectively addresses the challenges associated with this concept and has the capacity to aid struggling students in their comprehension and application of relevant principles.

Overall, based on the findings, it can be concluded that the contextualized intervention materials hold promise in facilitating students' learning and comprehension of the projectile motion topic, making them a valuable asset in physics education.

Recommendations

Based on the findings and conclusions presented in this study, the following recommendations are suggested.

1. Teachers of Secondary Physics may be asked to participate in webinars or seminars on creating CIM (Contextualized Intervention Material) to enhance the content, readability, and usability of the material, specifically in making assessments, activities, content, and a variety of examples that allow students to assess their own understanding of what they have learned.
2. Teachers may be trained on the CIM's (Contextualized Intervention Material) content, readability, and usefulness. The researcher is highly recommending to the Deped of Gingoog City Division to make extensive use of this produced and validated contextualized intervention material in teaching Physics.

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APPENDICES

APPENDIX A

ITEM ANALYSIS

Republic of the Philippines
Department of Education
Jacinto D. Malimas Sr. National High School
Odiongan, Gingoog City

Subject: SCIENCE 9
Grade and Sections: GRADE 9 (COMMITMENT (36), EXCELLENCE (40), GRATITUDE (32), TENACITY (33)
No. of Sections: 4
Overall Total # of Takers: 141
No. of Items: 50

ITEM ANALYSIS FOURTH QUARTER EXAMINATION

Item	No. of Students or Takers	Answers				Total No. of Correct Answers	Difficulty Index	Percent %
		A	B	C	D			
1	141	22	19	18	82*	82	0.58	58 %
2	141	11	94*	17	19	94	0.66	66%
3	141	82*	29	25	5	82	0.58	58%
4	141	3	95*	20	23	95	0.67	67%
5	141	89*	38	2	12	89	0.63	89%
6	141	39	92*	0	10	92	0.65	92%
7	141	86*	21	22	12	86	0.61	86%
8	141	11	90*	18	20	90	0.64	64%
9	141	7	84*	35	22	84	0.59	59%
10	141	16	37	88*	0	88	0.62	62%
11	141	9	15	72*	45	72	0.51	51%
12	141	37	81*	10	13	81	0.57	57%
13	141	92*	2	18	29	92	0.65	65%
14	141	88*	36	4	13	88	0.62	62%
15	141	19	87*	20	15	87	0.61	61%
16	141	86*	3	50	2	86	0.60	60%
17	141	9	87*	20	15	87	0.61	61%
18	141	19	88*	11	23	88	0.62	62%
19	141	13	40	85*	3	85	0.41	41%
20	141	31	91*	7	12	91	0.65	65%
21	141	40	0	84*	17	84	0.59	59%
22	141	85	21	13	22	85	0.60	60%
23	141	19	91*	7	24	91	0.64	64%

24	141	53	65*	11	12	65	0.46	46%
25	141	3	8	31	99*	99	0.70	70%
26	141	46	25	22	48*	50	0.34	34%
27	141	15	70*	16	40	70	0.49	49%
28	141	41	16	55*	29	55	0.39	39%
29	141	110*	13	5	13	110	0.78	78%
30	141	89*	23	6	23	89*	0.63	63%
31	141	18	70*	29	24	70	0.49	49%
32	141	1	125*	10	5	125	0.88	88%
33	141	30	110*	1	0	110	0.78	78%
34	141	16	80*	20	25	80	0.56	56%
35	141	14	20	87*	20	87	0.61	61%
36	141	10	5	6	120*	120	0.85	85%
37	141	18	98*	4	21	98	0.69	69%
38	141	7	100*	13	21	100	0.70	70%
39	141	41	87	6	7	87	0.61	61%
40	141	23	88*	10	20	88	0.62	62%
OVERALL TOTAL # OF CORRECT ANSWERS					3,466			
OVERALL TOTAL # OF TAKERS					141			

**Correct Answer*

Mastery/ Achievement Level Interpretation (DM No. 160, s. 2012)
96-100% - Mastered
86-95%- Closely Approximinating Mastery
66-85%- Moving Towards Mastery
35-65%- Average
15-34 %- Low
5-14%- Very Low
0-4%- Absolutely No Mastery

Remarks:

Based on DepEd Memorandum No.160, series 2012, item no. 26 has a mastery level of 34% with a descriptive equivalent of "Low" and is identified as the least learned competency in Physics (Science fourth quarter summative assessment result).

Least mastered competency (CODE: *S9FE-IVa-34*) Describe the horizontal and vertical motions of a projectile

Prepared by:

YEHLEN V. BENDANILLO
Science Teacher

Approved by:

Sheri Love M. Aguiman, PhD.
Principal II

APPENDIX B

TABLE OF SPECIFICATIONS

Republic of the Philippines
DEPARTMENT OF EDUCATION
Region X
DIVISION OF GINGOOG CITY
Brgy.22, Gingoog City
Tel.No.(088) 861 1446/ (088) 328 0118/ 08842-7475
E-mail add: gingoog.city@deped.gov.ph

TABLE OF SPECIFICATION

Grade Level: GRADE 9
Grading: FOURTH GRADING
Subject: SCIENCE (PHYSICS)

Learning Competency	No. of Hours/ Meetings	%	No. of Items	Adapted Cognitive Process Dimension						Item Placement
				Easy (60%)		Average (30%)		Difficult (10%)		
				Remembering	Understanding	Applying	Analyzing	Evaluating	Creating	
1. Describe the horizontal and vertical motions of projectile	5	12%	4	1	1	1	1			1-2,25-26,
2. Investigate the relationship between the angle of release and the height and range of the projectile	10	25%	10	3	3	1	1	1	1	3-8, 27-28,37-38
3. Relate impulse and momentum to collision of objects (e.g., vehicular collision)	2.5	6%	3	1	1	1				9-10,29
4. Infer that the total momentum before and after collision is equal	2.5	7%	3	1	1		1			11-12,30
5. Perform activities to demonstrate conservation of mechanical energy	5	12%	4	1	1	1	1			13-14,31-32
6. Construct a model to demonstrate that heat can do work	5	13%	6	2	2	1			1	15-18,33,39
7. Explain how heat transfer and energy transformation make heat engines work	5	12%	4	1	1	1	1			19-20,34-35
8. Explain how electrical energy is generated, transmitted, and distributed	5	13%	6	2	2	1		1		21-24,36,40
Total	**40**	**100%**	**40**	**24**		**12**		**4**		**40**

Prepared by:

Yehlen V. Bendanillo
SST-1

Noted by:

SHERICOVE M. AGUMAN
School Principal II

APPENDIX C

SCIENCE 9 FOURTH QUARTER TEST QUESTIONNAIRE (Physics)

JACINTO D. MALIMAS SR. NATIONAL HIGH SCHOOL
ODIONGAN, GINGOOG CITY

SCIENCE 9 SUMMATIVE ASSESSMENT
FOURTH GRADING

Name: _____ Grade & Section: _____

DIRECTIONS: Choose the letter of the best answer. Encircle the letter only.

1. The parabolic path that a rocket follows is called its_____

A.pathos B. pathogen C. trajectioning D. trajectory

2. Which of the following object is not accelerating?

A. A ball being juggled

B. a woman walking at 2.5 m/s along a straight road

C. A satellite circling Earth

D. A braking cyclist

3. What is the initial horizontal acceleration of a projectile?

A. 0 m/s B. 9.8 m/s C. 5 m/s D. 10 m/s

4. Which of the following would NOT be considered a projectile

A. a basketball is thrown straight up

B. a basketball rolling down a slope

C. a basketball rolling off a table

D. a basketball is thrown in the air

5. When an object is launched horizontally, what is the initial vertical velocity?

A. 0 m/s

B. it's always 9.8 m/s

C. it depends on the horizontal launch speed

D. It depends on the color of the object being launched .

6. What forces act in the *y* direction that causes an object to travel in a parabolic arc?

A. Friction B. Gravity C. Tension D. No force acting

7. As an object travels through the air, what happens to its vertical velocity?

A. changes continuously B. remains the same C. constant D. at rest

8. A man wants to shoot an arrow so that it has the greatest range (horizontal distance). At what angle should he shoot the arrow?

A. 10 degrees B. 45 degrees C. 60 degrees D. 90 degrees

9. What is the unit of impulse?

A. N/s B. N-s C. N D. m/s_{222}

10. Momentum is conserved in this type of collision

A. elastic B. inelastic C. momentum is conserved in both types of collisions D. a&b

11. The momentum of an object depends upon the objects _____ and _____.

A. size and shape B. mass and speed C. mass and velocity D .mass and energy

12. When the speed of an object is doubled, its momentum _____.

A. remains unchanged in accord with the conservation of momentum

B. doubles

C. quadruples

D. decreases

13. What are the two types of Mechanical Energy (ME)?

A. Kinetic and Potential Energy

B. Kinetic and Nuclear Energy

C. Potential and Chemical Energy

D. Thermal and Kinetic Energy

14. What is the conservation of energy?

A. Energy is neither created nor destroyed in an isolated system

B. (1/2) mv_2

C. mgh

D. potential energy alone

15. What do you call a process without gain or loss of heat?

A. abiotic process B. adiabatic process C. Thermal D. Internal process

16. It is called the sum of all kinetic and potential energies of the atoms/ molecules in the system.

A. Internal/thermal energy B. Kinetic energy

C. Mechanical energy D. Potential energy

17. It is a device that changes thermal energy into mechanical work

A. pulley B. steering wheel C. heat engine D. gear

18. Heat flows spontaneously from hot objects to_____

A. hot objects B. cold objects C. warm objects D. both cold and hot

19. What is the definition of conduction?

A. when heat is transferred through waves of heat across a distance

B. when heat is transferred through the circulation of liquid or gases

C. when heat transfers from objects that are touching.

D. when heat stays in place.

20. What kind of heat transfer happens when the sun is heating your body?

A. conduction B. radiation C. convection D. density

21. Electricity distributed along_____.

A. direct current B. alternating current C. Transmission lines D. Transformer

22. What is the function of the electric meter?

A. it measures the consumption of electricity

B. it carries a current of 16 amps

C. it contains a switch

D. it is an adaptor

23. Which of the following correctly matches the colors of the live, neutral, and earth wires?

A. yellow and green, blue, brown

B. brown, blue, yellow, and green

C. yellow and green, brown, blue

D. blue, brown, yellow, and green

24. The function of the transformer in the transmission of electricity is to____

A. increase the resistance

B. change the voltage

C. reduce the time to transmit the electricity

D. increase the power

25. A sepak takraw that is kicked from a height of two meters follows a path that is _____

A. circular B. linear C. hyperbolic D. parabolic

26. If a projectile is launched horizontally from a height of 12m, how long will it take to hit the ground?

A. 2.45 seconds B. 5.16 seconds C. 1.56 seconds D. 4.25 seconds

27. What is the direction of the acceleration for any projectile?

A. The direction of the projectile is traveling.

B. down

C. up

D. sideways

28. What effect does the mass of a projectile have on the time it is in the air? (Neglect the air resistance)

A. The lighter the projectile, the greater the time in the air

B. The heavier the projectile, the greater the time in the air

C. it has no effect

D. The lighter the projectile the less time in the air

29. The two *Patintero* players with a mass of 75 kg and 100 kg run directly toward each other with speeds of 6 m/s and 8 m/s respectively. If they grab

each other as they collide, the combined speed of the two players just after the collision would be:

A. 2 m/s B. 3.4 m/s C. 4.6 m/s D. 7.1 m/s

30. A 10 kg toy truck moves at 5 m/s east. It collides heads-on with a 5 kg toy car moving 10 m/s moving west. What is the total momentum of the system?

A. 0 kg.m/s B. 30 kg.m/s C. 50 kg.m/s D. 10 kg.m/s

31. What would happen if friction increased on a roller coaster?

A. The speed of the roller coaster would increase

B. The speed of the roller coaster would decrease

C. Nothing would happen

D. The roller coaster would fly away farthest

32. If gravity suddenly decreased, what would happen to the roller coaster?

A. It would be harder to go up hills and on loops

B. The roller coaster would fly off the track

C. Nothing would happen

D. It would be normal

33. 0. 605 m3 of gas is inside of a piston that is stuck in place. A pressure of $1.50 \times 10_4$ Pa (Pascal) is applied to the piston and the piston doesn't budge. How much work was done?

A. 9075 J B. 24793 J C. 0 J D. $4.03 \times 10_5$ J

34. See the image below. It is a lava lamp, when the light bulb heats the wax, the wax rises. When the wax cools, it falls. This cycle of rising/ falling is an example of:

Source: quizizz.com

A. conduction B. convection C. Radiation D. condensation

35. If the baby chickens are kept warm from the heat lamps, what do you think is the type of heat transfer that demonstrates this scenario?

A. conduction B. convection C. radiation D. incubation

36. The efficiency of transmitting electrical power by cable through a great distance can be improved by_____

A. lowering the voltage and using a thick cable

B. lowering the voltage and using a big current

C. increasing the voltage and using thin cable

D. increasing the voltage and using thick cable

37. A projectile is launched horizontally at 25 m/s from a mountain cliff of Brgy. Odiongan at 30 m high. What will you do to increase the time of the projectile in the air?

A. launch with a greater velocity

B. Launch downward instead of horizontal

C. Launch with a smaller velocity

D. Launch from a higher mountain cliff

38. A plane flying horizontally at 120 m/s drops a *Uway* (rattan) basket. When the basket strikes the ground 15 seconds later, what is the magnitude of the horizontal component of its velocity?

A. 147m/s B. 120m/s C. 1,800 m/s D. 8m/s

39. An inflated balloon is placed in a tub of hot water, and the balloon expands. What can be said of the work that was done?

A. it is positive and the water did work on the balloon

B. it is negative and the balloon did work on the water

C. it is positive and the balloon did work on the water

D. It is negative and the water did work on the balloon

40. Why is alternating current used instead of direct current in the transmission of electricity through long distances?

A. Only alternating current can flow through the cables

B. Alternating current voltage can be stepped up or stepped down by using transformers.

C. Most of electrical appliances work only with alternating current.

D. Generating direct current is more complicated than generating alternating current.

APPENDIX D

An instrument for Strategic Intervention Material Evaluation

A Contextualized Intervention Material on Projectile Motion

Direction: Please evaluate this Contextualized Intervention Material entitled PROJECTILE MOTION honestly. Rest assured that your answers will be kept confidential by the researcher. Write also for your comments and suggestions for more improvement of this CIM.

Please indicate your answers by putting check (/) the following responses for every category:

4- Strongly Agree
3- Agree
2- Disagree
1- Strongly disagree

CRITERIA	RATING			
	4	3	2	1
Focus I: CONTENT				
Title Card				
Title was short and catchy.				
Title was significantly related to the competency being measured.				
Guide Card				
Words used were simple and easily understood.				
Sentences were grammatically correct.				
Activity Cards				
Activities were appropriately designed to the level of the students.				
Activities were paralleled to the least learned competency and sub tasks.				
Assessment Cards				
Assessments were appropriately designed to the level of the students.				
Assessments were paralleled to the least learned competency and sub-tasks.				
Enrichment Cards				
Enrichments were appropriately designed to the level of the students.				
Enrichments were paralleled to the least learned competency and sub-tasks.				
Reference Card				

Sources are properly cited.				
Sources are relevant to learning competency				
Focus II: READABILITY				
Title Card				
Texts are presented accurately and clearly.				
Size and format of print is appropriate.				
Guide Card				
Attracts the reader significantly.				
Least learned competency is clearly stated.				
Activity Cards				
Directions were clearly stated and understandable to the students.				
Activities and tasks arranged logically.				
Assessment Cards				
Directions were clearly stated and understandable to the students.				
Vocabulary used in assessment is appropriate to the student's grade level.				
Enrichment Cards				
Directions were clearly stated and understandable to the students.				
Clearly provides activities that reinforce the content of the lesson.				
Reference Card				
Language used were simple and easily be understood by the students.				
Students may be referred to further reading.				
Focus III. Usability				
Title Card				
Title was enticing to the students to use it.				
Title is accurate and well-integrated into the material.				
Guide Card				
Guide title and statements were enticing to the students.				
Guide students on how to use the CIM.				
Activity Cards				
Activities were designed to measure to its truest objectives.				
Provide examples to concretize the concepts.				
Assessment Cards				
Assessments were designed to measure to its truest objectives.				

Provides exercises, drills and activities that allow students to assess their understanding of what they have learned.				
Enrichment Cards				
Enrichments were designed to strengthen conceptual understanding.				
Enrichments were designed to extend learning by providing exercises for further application of knowledge.				
Reference Card				
Answer's key was stipulated for quick reference of the students for correcting their answers				
Students may be referred to further reading**.**				
Focus IV. Level of Contextualization				
Title Card				
The title was relevant to learner's learning environment.				
Title was significantly contextualized.				
Guide Card				
Gives a preview of what the students will learn.				
Presents the focus skill.				
Activity Cards				
Provides localize activities that are organized based on listed competencies/ topics.				
Provide activities that use materials that are readily available in the environment to allow students to formulate ideas on their own.				
Assessments Cards				
Provides exercises, drills, and activities that allow students opportunities to explore the world round them.				
Formulates in standard test formats to give students practice in authentic test-taking techniques.				
Enrichment Cards				
Provides opportunities for the students to apply what they have learned.				
Provides opportunities for the students to work independently or in group to explore answers or in new contexts.				
Reference Card				
Provides carefully researched list resources that will reinforce concepts and skills				

learned.				
Provide additional content not found in the textbook.				
TOTAL SCORE:				
Comments and Suggestions:				

Validated by: _____
Signature over Printed Name/ Designation
Date of Evaluation: _____

APPENDIX E

An Instrument for Validation of Strategic Intervention Material For Prospective Student- users

STUDENT'S PERCEPTION OF THE STRATEGIC INTERVENTION MATERIALS IN GRADE 9 SCIENCE

Title of the Material: Contextualized Intervention Material in Projectile Motion

Name of Student: _____ Signature: _____

Grade/ Section:
_____School:_____

Directions: Please check the given scale as the basis for your assessment and give your knowledge to the best of your ability. Check the appropriate lines that best describe your assessment of the lessons and activities.

Legend: (Scale Responses)

Score	Rating	Qualitative Description
4	Strongly Agree	Lessons are very easy, appealing, useful and meaningful
3	Agree	Lessons are easy, appealing, useful and meaningful
2	Disagree	Lessons are slightly easy, appealing, useful and meaningful
1	Strongly Disagree	Lessons are not easy, appealing, useful, and meaningful

CRITERIA	RATING			
A. READABILITY	**4**	**3**	**2**	**1**
1. The font size is easy to read.				
2. The direction/instructions are easy to follow.				
3. The lessons are easy to understand.				
4. The lessons are appealing as they are related to real life.				
5. Getting the correct answers to the questions and getting the task done encourages me to continue the next lesson.				
B. USABILITY				
1. The vocabulary used is suitable for my level.				
2. The lessons provide what I need to learn about the basic concepts on the least mastered topic in Grade 9 Science (Projectile Motion).				
3. The lessons helped me understand better the basic concepts on the least learned topic in Grade 9 Science (Projectile Motion).				
4. The lessons helped me develop my interest in the least learned topic in Grade 9 Science (Projectile Motion)				
5. The lessons helped me develop my analytical skills in doing the different activities about the least learned topic in Grade 9 Science (Projectile Motion).				

OBSERVATIONS/PROBLEMS/SUGGESTIONS ON THE LESSONS

1. What are your observations on the concepts, activities, and tasks presented in the lesson?

2. What are the problems you encounter with the concepts presented and with doing the activities and tasks in the lesson?

3. What suggestions and comments can you give on the concepts, activities, and tasks that will make them more easy, appealing, useful, and meaningful to the students?

Modified by the Researcher and Adopted from the criteria set by DepEd Guidelines and Processes for LRMDS Assessment and Evaluation (2009)

APPENDIX F

Letter of Permission to the School Superintendent

JESNAR DEMS S. TORRES, CESO V
Schools Division Superintendent
Division of Gingoog City

Sir:

Greetings!

The undersigned is conducting a Research Study on the Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics. This is a requirement leading to a degree of Master of Arts in Education (MAED).

One of the bases in the development of contextualized intervention material is the determination of least learned competency in Grade 9 Science for the fourth quarter in the field of Physics. The three experts in the field of Science who are the Supervisor of Science and Two Master Teachers from the Department of Education in this division validated the research instrument that will be used to evaluate the contextualized intervention material particularly SIM.

In this regard, the undersigned is respectfully asking permission to conduct the study in Jacinto D. Malimas Sr. National High School.

It would be much appreciated if a favorable action is taken on this request.

More power and May God bless you!

Respectfully yours,

Yehlen V. Bendanillo
Researcher

Noted:

Romeo M. Giducos, EdD.
Thesis Adviser

Nelia S. Raganas, PhD.
Dean, Office of the Graduate Studies

APPENDIX G

Letter of Permission to the School Principals

LILIBETH C. ESTROSOS
School Principal
San Luis National High School
Barangay San Luis, Gingoog City

Madame:

Greetings!

The undersigned is conducting a Research Study on the Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics. This is a requirement leading to a degree of Master of Arts in Education (MAED).

One of the bases in the development of CIM (Contextualized Intervention Material) is the determination of least learned competency in Grade 9 Science for the fourth quarter in the field of Physics. The three experts in the field of Science validated the research instrument that will be used to evaluate the contextualized intervention material particularly SIM.

In this regard, the undersigned is respectfully asking permission to have research instrument/ evaluation form and Contextualized Intervention material be validated of Master Teacher in Science at San Luis National High School, Mrs. Susan Balighot

It would be much appreciated if a favorable action is taken on this request.

More power and May God bless you!

Respectfully yours,

Yehlen V. Bendanillo
Researcher

Noted:

Romeo M. Giducos, EdD.
Thesis Adviser

Nelia S. Raganas, PhD.
Dean, Office of the Graduate Studies

EPITACIO P. LAUROZA, JR., PhD.
School Principal
Jacinto D. Malimas Sr. National High School
Purok 2, Brgy. Odiongan, Gingoog City

Sir:

Greetings!

The undersigned is conducting a Research Study on the Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics. This is a requirement leading to a degree of Master of Arts in Education (MAED).

One of the bases in the development of contextualized intervention material is the determination of least learned competency in Grade 9 Science for the fourth quarter in the field of Physics. The three experts in the field of Science validated the research instrument that will be used to evaluate the contextualized intervention material particularly SIM.

In this regard, the undersigned is respectfully asking permission to have research instrument/evaluation form and Contextualized Intervention material be validated of Master Teacher and teachers in Science at Jacinto D. Malimas Sr. National High School, Ms. Mary Thessa Jude C. Dalupere.

It would be much appreciated if a favorable action is taken on this request.

More power and May God bless you!

Respectfully yours,

Yehlen V. Bendanillo
Researcher

Noted:

Romeo M. Giducos, EdD.	Nelia S. Raganas, PhD.
Thesis Adviser	Dean, Office of the Graduate Studies

APPENDIX H

Letter of Request to the Research Instrument Validators

NILDA U. VILLEGAS
Science Supervisor
Division of Gingoog City

Sir/Ma'am:

Greetings!

The undersigned is conducting a Research Study on the Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics for Grade 9 Science. This is a requirement leading to a degree of Master of Arts in Education (MAED).

The Contextualized Intervention Material Evaluation Form is the tool that will be used to evaluate the intervention material of this study. Some of the criteria in CIM Evaluation form is adapted but modified by the researcher based on the criteria stipulated in DepEd Memorandum No. 225, series of 2009 enclosure No.2 *"Criteria for Science Intervention Materials (SIM)"* and needs to be validated by the teachers/supervisors who are experts in this field of Science, as suggested by the panelists of this study. The indicators are categorized in terms of content, readability, usability, and level of contextualization.

As an expert in your field, kindly evaluate each criterion based on the following rating scale with its corresponding descriptive meaning:

5 the criteria exceed expectations (no modification needed)

4 the criteria meet expectations (no modifications needed)

3 the criteria meet expectations (no modification needed but could be improved by minor changes)

2 the criteria are below expectations (some modifications or revisions are needed)

1 the criteria are not acceptable (discard)

Please put a check on the box below the rating which you feel is appropriate for its corresponding criteria. Your remarks and suggestions also for revision are very much welcome.

Thank you very much for sharing your expertise in this endeavor!

Respectfully yours,

Yehlen V. Bendanillo
Researcher

MARY THESSA JUDE C. DALUPERE
Master Teacher in Science
Jacinto D. Malimas National High School
Purok 2, Brgy. Odiongan Gingoog City

Sir/Ma'am:

Greetings!

The undersigned is conducting a Research Study on the Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics for Grade 9 Science. This is a requirement leading to a degree of Master of Arts in Education (MAED).

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Thank you very much for sharing your expertise in this endeavor!

Respectfully yours,

Yehlen V. Bendanillo
Researcher

SUSAN S. BALIGHOT
Master Teacher Science
San Luis National High School
Brgy. San Luis, National High School

Sir/Ma'am:

Greetings!

The undersigned is conducting a Research Study on the Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics for Grade 9 Science. This is a requirement leading to a degree of Master of Arts in Education (MAED).

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Thank you very much for sharing your expertise in this endeavor!

Respectfully yours,

Yehlen V. Bendanillo
Researcher

APPENDIX I

Letter of Request to Contextualized Intervention Material Validators

MARY THESSA JUDE C. DALUPERE
Master Teacher in Science
Jacinto D. Malimas Sr. National High School
Purok 2, Brgy. Odiongan, Gingoog City

Madame:

Warmest greetings!

The undersigned is presently conducting a study entitled "Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics" in partial fulfillment of the requirements for the degree of Master in Education (MAED).

With this, I am humbly requesting for your help by sharing your expertise to validate the developed contextualized intervention material (CIM) in terms of content, readability, usability and level of contextualization which already underwent the first phase evaluation under my thesis adviser . Being a teacher and a master degree holder with specialization in science, I believe that you are in best position to judge whether the contextualized intervention material (CIM) have met the standards or not.

Attached herewith is the Contextualized Intervention Material Evaluation Form. Please feel free to write also your honest comments and / or suggestions.

Thank you very much for sharing your expertise in this endeavor and for making yourselves a part of this study.

Respectfully yours,

Yehlen V. Bendanillo
Researcher

NILDA U. VILLEGAS
Supervisor in Science
Division of Gingoog City
Barangay 22, Gingoog City

Madame:

Warmest greetings!

The undersigned is presently conducting a study entitled "Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics" in partial fulfillment of the requirements for the degree of Master in Education (MAED).

With this, I am humbly requesting for your help by sharing your expertise to validate the developed contextualized intervention material (CIM) in terms of content, readability, usability and level of contextualization which already underwent the first phase evaluation under my thesis adviser . Being a teacher and a master degree holder with specialization in science, I believe that you are in best position to judge whether the contextualized intervention material (CIM) have met the standards or not.

Attached herewith is the Contextualized Intervention Material Evaluation Form. Please feel free to write also your honest comments and / or suggestions.

Thank you very much for sharing your expertise in this endeavor and for making yourselves a part of this study.

Respectfully yours,

Yehlen V. Bendanillo
Researcher

SUSAN S. BALIGHOT
Master Teacher in Science
San Luis National High School
Barangay San Luis, Gingoog City

Madame:

Warmest greetings!

The undersigned is presently conducting a study entitled "Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics" in partial fulfillment of the requirements for the degree of Master in Education (MAED).

With this, I am humbly requesting for your help by sharing your expertise to validate the developed contextualized intervention material (CIM) in terms of content, readability, usability and level of contextualization which already underwent the first phase evaluation under my thesis adviser . Being a teacher and a master degree holder with specialization in science, I believe that you are in best position to judge whether the contextualized intervention material (CIM) have met the standards or not.

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Thank you very much for sharing your expertise in this endeavor and for making yourselves a part of this study.

Respectfully yours,

Yehlen V. Bendanillo
Researcher

APPENDIX J

Certificate of Validation of Contextualized SIM

Republic of the Philippines
Department of Education
Region X- Northern Mindanao
DIVISION OF GINGOOG CITY
Jacinto D. Malimas Sr. National High School
Odiongan, Gingoog City

CERTIFICATE OF VALIDATION

To whom it may concern:

This is to certify that **Ms. Yehlen V. Bendanillo,** the Grade VIII adviser of Jacinto D. Malimas Sr. National High School , North 1 District, Gingoog City Division has constructed the Strategic Intervention Material (SIM) in Science 9 entitled "Contextualized Intervention Material in Science 9" as aid to address least learned competency in Science 9 for the fourth quarter as to improve learner's performance in Physics.

Reviewed and Validated:

MARY THESSA JUDE CARREDO-DAWPARE, ME (PHYSICS)
Master Teacher I

SUSAN J. BALIGHOT, MAED Scina
Master Teacher I

Approved:

NILDA U. VILLEGAS
Education Program Supervisor- Science

APPENDIX K

Certificate of Validation of Research Instruments from the Experts

Republic of the Philippines
Department of Education
REGION X
SCHOOLS DIVISION OF GINGOOG CITY

CERTIFICATE OF VALIDATION

This is to certify that the instrument "A Contextualized Intervention Material on Projectile Motion" evaluation form used by Yehlen V. Bendanillo, Master of Arts in Education researcher, had undergone validation by the experts. The experts can attest that the questionnaire had passed through careful examination and was proven substantially useful for her thesis entitled: **"Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics".**

CERTIFIED BY:

NILDA U. VILLEGAS
Education Program Supervisor- Science

SUSAN S. BALIGHOT
Master Teacher Science

MARY THESSA JUDE C. DALUPERE
Master Teacher Science

Address: National Highway, Brgy. 22, Gingoog City
Tel. No.: (+632) 328-0108/0118
Email: gingoog.city@deped.gov.ph

APPENDIX L

Certificate of Validation of Research Instrument for Prospective Student-users

Republic of the Philippines
Department of Education
REGION X
SCHOOLS DIVISION OF GINGOOG CITY

CERTIFICATE OF VALIDATION

This is to certify that the instrument "Student's Perception of the Strategic Intervention Materials in Grade 9 Science" assessment survey questionnaire used by Yehlen V. Bendanillo, Master of Arts in Education researcher, had undergone validation by the experts. The experts can attest that the questionnaire had passed through careful examination and was proven substantially useful for her thesis entitled: **"Development and Validation of Contextualized Intervention Material in Teaching Junior High School Physics".**

CERTIFIED BY:

NILDA U. VILLEGAS
Education Program Supervisor- Science

SUSAN S. BALIGHOT
Master Teacher Science

MARY THESSA JUDE C. DALUPERE
Master Teacher Science

Address: National Highway, Brgy. 22, Gingoog City
Tel. No.: (+632) 328-0108/0118
Email: gingoog.city@deped.gov.ph

APPENDIX M

Criteria for Science Intervention Material (SIM) from DepEd Memorandum No.225, s. 2009

Enclosure No. 2 to DepED Memorandum No. 225, s. 2009

Criteria for Science Intervention Materials (SIM)

AREA	POINTS	1	2	3	4	5	6	7	8	9	10	11
1. Subtasking	15											
• Competency-based 5												
• Bloom's Taxonomy followed 6												
• SMAR-C 4												
2. Congruence	15											
• Activities in line with content and skills 5												
• Assessment in line with content and skills 10												
3. Usability/Functionality	45											
• Language 3												
• Title card 2												
• Guide card 4												
• Activity card 14												
• Assessment card 3												
• Enrichment card 3												
• Reference card 3												
• Answer card 2												
• Packaging 8												
4. Replicability	25											
• Validated before classroom use 5												
• Dev. Mat. Based on least learned LC 5												
• Mat. Used improved mastery level 10												
• Handy & easy to copy 3												
• Cost 2												

Note: Points for the 3 items under replicability may be asked during the congress/actual judging.

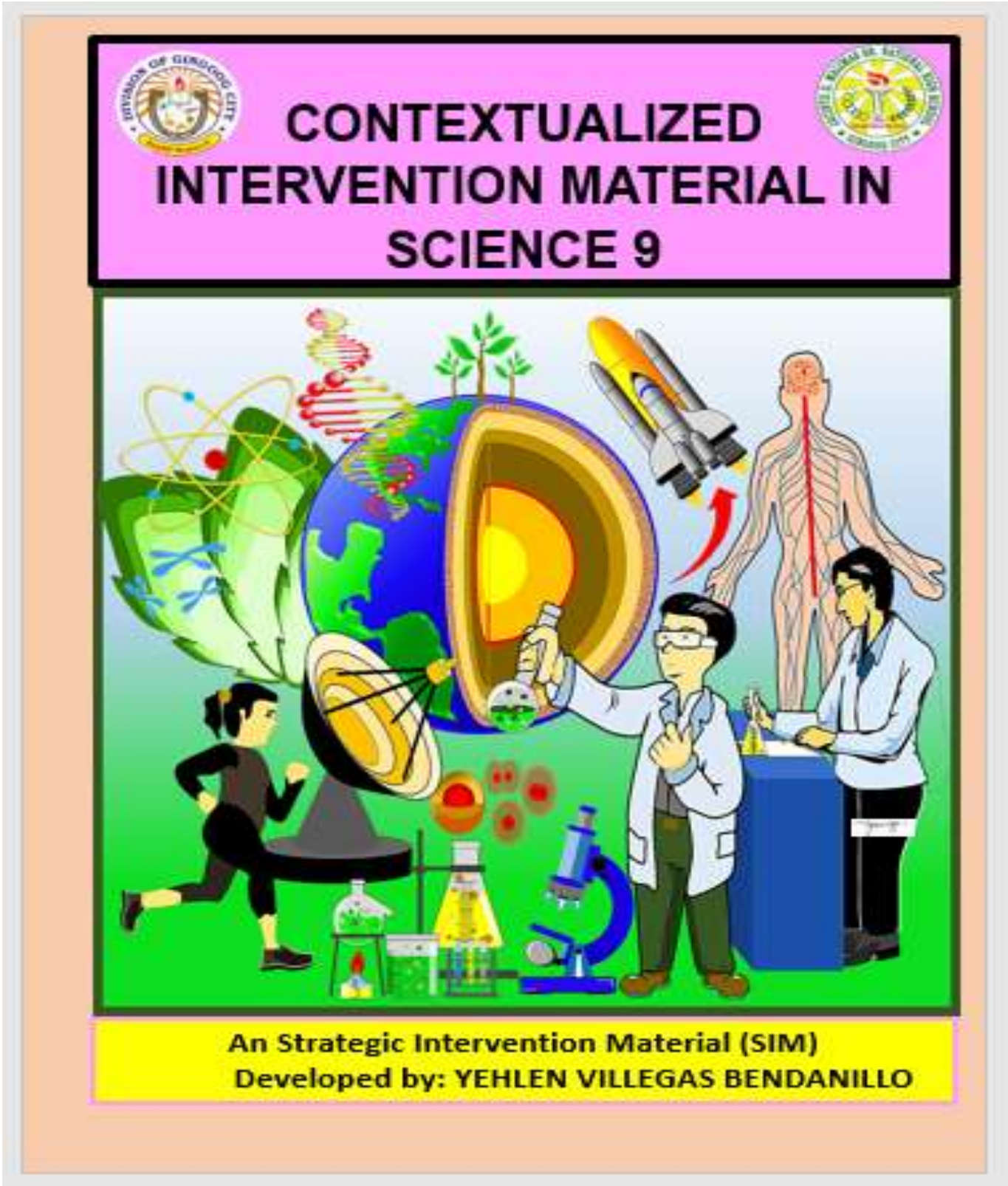
APPENDIX N

PROFILE OF THE VALIDATORS

Name	SUSAN S. BALIGHOT
Agency	DEPARTMENT OF EDUCATION
Position	MASTER TEACHER I
Length of Teaching Experience	32 YEARS
Name	MARY THESSA JUDE CARRIDO- DALUPERE
Agency	DEPARTMENT OF EDUCATION
Position	MASTER TEACHER I
Length of Teaching Experience	20 YEARS
Name	NILDA U. VILLEGAS
Agency	DEPARTMENT OF EDUCATION
Position	EDUCATION PROGRAM SUPERVISOR SCIENCE
Length of Teaching Experience	38 YEARS

APPENDIX M

Developed Contextualized SIM in Science 9



Republic of the Philippines
Department of Education
Region X- Northern Mindanao
DIVISION OF GINGOOG CITY
Jacinto D. Mallmas Sr. National High School
Odiongan, Gingoog City

CERTIFICATE OF VALIDATION

To whom it may concern:

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Reviewed and Validated:

Master Teacher I

Master Teacher I

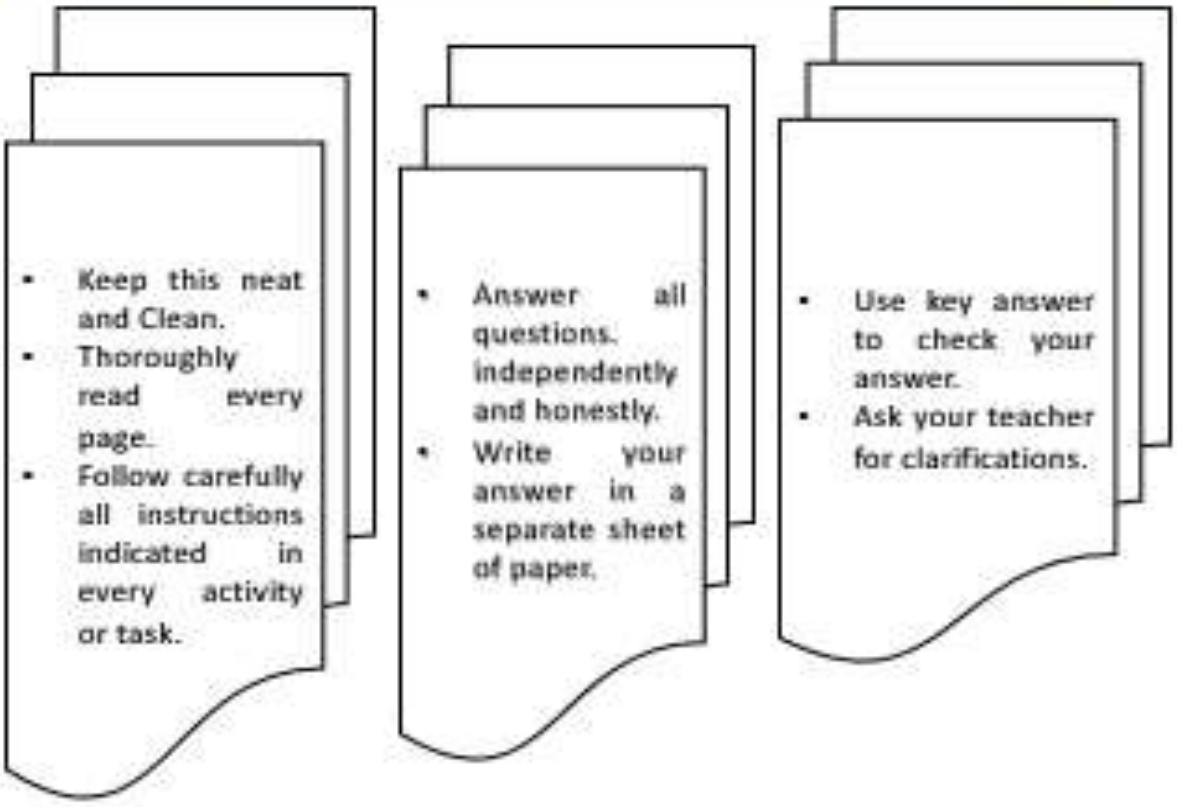
Approved:

WILDA U. VILLEGAS
Education Program Supervisor- Science

PURPOSE OF STRATEGIC INTERVENTION MATERIAL (SIM)

The material is intended for intervention in the classroom learning on Projectile Motion. Activities and exercises to be followed and answered are prepared and contextualized in order to broaden understanding of learners on topics about projectile motion.

HOW TO USE THIS STRATEGIC INTERVENTION MATERIAL (SIM)



TITLE CARD

Projectile Motion

Least Learned Competency:

- Describe the horizontal and vertical motions of a projectile **(S9FE-Iva-34)**

Table of Contents

Guide Card

Hello I am Ms. Cim. Welcome to an exciting adventure as we take another journey to the world of Physics. This time we will be taking about Projectile Motion. So secure your seatbelt as we go through this SIM. Have fun learning!

Guide Card

CAN I EXPECT YOU ?

This SIM covers lessons about projectile and was summarized thus you can master it in just a little span of time

Learning Objectives:

After reading this SIM the students should be able to :

1. Define projectile motion;
2. Differentiate projectile motion from vertical and horizontal; and
3. Describe the horizontal and vertical motions of projectile.

Guide Card

What I Need to know

Projectile motion can be observed in sports such as volleyball, basketball, soccer, sepak takraw, badminton , tennis , archery , javelin throw, etc. In some crimes the knowledge of projectile motion is also very useful for an instance, if someone was shot, through looking into the angle and path of parabola to identify the origin of the bullet.

Projectile is the blend of vertical and horizontal motions that are completely independent from each other. Projectile path is parabolic because of the pull of the gravity towards the object (projectile). As the object moves horizontally, the gravity pulls the object slowly downward until it falls to the ground. The height is the vertical displacement and the range is the horizontal distance.

Activity Card 1

Pre- Assessment

Directions: Choose the letter that best completes the statement. Write your answers in your Science Activity Notebook. Good luck !

1. An object is launched at an angle. How does the final velocity compare to the initial velocity if it lands at the same horizontal level?
   A. at constant velocity
   B. equal *and* opposite
   C. opposite
   D. unable to determine

2. Which of the following is an example of projectile motion?
   A. a bullet being fired from a gun
   B. a *trumpo* orbiting in the floor
   C. a *karatela* running on the highway
   D. dropping an aluminum can into the recycling bin

3. What is the path of a projectile ?
   A. a hyperbola
   B. a parabola
   C. a wavy line
   D. projectiles do not follow a predictable path

4. Which of the following is the motion of objects moving in two dimensions under the influence of gravity?
   A. directrix
   B. horizontal velocity
   C. parabola
   D. projectile motion

5. A plane flies from Gingoog City to Cagayan De Oro City. Gingoog City is 1540 km. west and 1160 km south of Cagayan De Oro . What is the total displacement and direction of the plane?
   A. 1930 km. 37.0 degrees south of west
   B. 1850 km. 37.0 degrees south of west
   C. 1930 km. 43.0 degrees south of west
   D. 1850 km. 43.0 degrees south of west

6. Which of the following is NOT an example of projectile motion?
   A. a long jumper in action
   B. a volleyball served over a net
   C. a *sepak takraw* ball kick by a player
   D. a hot- air balloon drifting toward Brgy. Odiongan

7. A model rocket flies horizontally off the edge of the cliff of Sitio Dulag at a velocity of 50.0 m/s. If the canyon below is 100.0 m deep, how far from the edge of the cliff does the model rocket land?
   A. 112 m C. 337 m
   B. 225 m D. 400 m

8. What is the direction of the acceleration for any projectile?
   A. up
   B. down
   C. sideways
   D. the direction of the projectile is traveling

9. A track star in the long jump goes into the jump at 12 m/s and launches herself at 20. 0 degrees above the horizontal. How long is she in the air before returning to Earth ? (g= 9.81 m/s ^{2})
   A. 0. 42 s C. 1.5 s
   B. 0. 83 s D. 1.2 s

10. A pellet is fired horizontally from a pellet gun. At the same time and from the same height, a pellet is dropped. If we neglect the effects of air resistance, how will the time the two pellets spend in the air compare ?
   A. the pellet that is fired will spend less time in the air, hitting the ground first
   B. both pellets will spend the same amount of time in the air, hitting at the same time
   C. there is not enough information to determine this
   D. the pellet that is fired will spend longer in the air, hitting the ground after the dropped pellet.

Activity Card 2

READY, AIM FIRE!

POPSICLE STICK CATAPULT
(Tirador, Pintik)

Materials:

5 small popsicle stick
2 Large popsicle stick
3 rubber bands
Cotton balls *(bulak)*

Procedure

(*Note: The catapult described in this activity is safe when used with a cotton ball. Shooting hard object using homemade catapults can be dangerous. Make sure any object you launch are soft and light as not to harm anyone or cause any damage around you.*)

1. Make a stack of five small popsicle sticks. Use two rubber bands to tightly wrap each end of the stacked popsicles. This is called a "fulcrum".

2. Insert one large popsicle stick between the first and second small popsicle stick in the five- stick bundle.

3. Place the second large popsicle stick under the fifth popsicle stick of the five-stick bundle.

4. Line up the two large popsicle sticks and tie them together at just one end. Try to tie the band as close as you can to the edge of the two- stick bundle.

5. Hold the catapult with one hand, and use the other hand to pull the lever down. Release to lunch your cotton ball. The closer the five sticks banded together gets to the edge of the fulcrum, the more leverage the catapult will have.

Q1. What happen to a cotton ball when you launched it? Did it go high or low?

Q2. What kind of energy is released by launching the cotton ball?

Q3. How do you describe the shape for projectile of a catapult?

Guide Card

What I Need To know

Projectile motion can be assumed by analyzing the horizontal and the vertical components of the displacement and velocity which is called vectors.

Projectile Motion Formula

(Projectiles Launched Horizontally (*half-Projectiles*)

For half- projectiles, you can use the following formula to describe the motion of the projectiles.

$h = \frac{1}{2} g t^2$ Where: h = height at which the projectile is released

$x_o = vt$ g = acceleration due to gravity

t= is the elapsed time

x_o = the horizontal displacement

v = horizontal velocity of the projectile

Activity Card 3

Solving Projectile Motion Problem

Directions: Solve the following problem using the equation of projectile motion.

PROBLEM 1:

A *Takraw Ball* is kicked horizontally has no initial vertical velocity off a 20.0- meter high hill and lands a distance of 30.0 meters from the edge of the hill. Calculate the initial horizontal velocity of the ball.

PROBLEM 2

Bea a grade 10 athlete of Jacinto D. Malimas Sr. National High School kicks a ball during the district meet with an initial velocity of 25 m/s at an angle of 30 degrees with the horizontal. Calculate the ball's time of flight, horizontal distance and maximum height.

Activity Card 4

Complete Me!

Directions: Complete the statements below with the correct words . Choose from the word bank.

Gravity	**zero**	**independent**
Increasing		**projectile launched at angle**
projectiles launched horizontally		

1. Projectiles have vertical and horizontal components that are _____of each other.
2. The only force acting upon a projectile is _____
3. The *jolen* (marble) rolling down the incline has a velocity that is _____
4. Projectiles do not have horizontal forces, therefore horizontal acceleration is _____
5. There are two kinds of problems related to projectile namely _____and _____.

Guide Card

PLEASE ANSWER THIS FORM TO BE USED TO FOLLOW UP YOUR PROGRESS

1. What I already know?

_____

_____

_____

2. What I learned?

_____

_____

_____

3. What I still need to know?

_____

_____

_____

Assessment Card

Answer Me!

Directions: Write the letter of the correct answer on your paper.

1. At what degree should a water hose be pointed in order for the water to land with the highest horizontal range?
   A. 0 ° C. 45 °
   B. 30 ° D. 60 °

2. Given the same initial velocity, at what another angle should a ball be hit to reach the same distance if it is being shot at an angle of 30 ° and it reaches a distance of 50m.
   A. 15 ° C. 60 °
   B. 45 ° D. 75 °

3. When objects are undergoing projectile motion, what do you call the force acting on them?
   A. air drag C. gravitational force
   B. air resistance D. normal force

4. What do you call objects moving in two dimensions?
   A. free- body C. projectile
   B. parabola D. trajectory

5. What do you call the path taken by an object moving in projectile motion?
   A. force B. gravity C. projectile D. trajectory

6. In a place where gravity doesn't exist, what will happen to a ball thrown upward? It will ___
   A. float C. follow a parabolic path
   B. fall down D. continuously move upward

7. What is the value of acceleration due to gravity equal to?
   A. 0 m/s^2 B. 9.8 m/s^2 C. 9.8 m/s D. 9.8 m

8. What is the acceleration of a sepak takraw ball that is hit vertically upward by a player after 1 second ?
   A. 0 s B. 1 m/s^2 C. 9.8 m/s^2 D. 9.8 m

9. At which part of the path does projectile have minimum speed?
   A. at the top of its path C. when it is thrown
   B. half-way to the top D. when it returns to the ground

10. A projectile is thrown 30 ° above horizontal. What happens to its acceleration as it moves upward? It_____
   A. remains the same
   B. decreases because its velocity is decreasing
   C. increases because its velocity is directed upward
   D. decreases because its velocity is directed upward

Enrichment Card

Solve Me!

Additional Activities

Directions: Solve the following problems. Write the answer in a sheet of paper.

For numbers 1-3: A football player kicks a football from the ground level with an initial velocity of 27 m/s, 30 degrees above the horizontal.

1. What is the maximum height (h) the ball reached ?
   A. 2. 44 m B. 7.89 m C. 9.30 m D. 20. 80 m

2. How many seconds did it take the football to return to the launching height?
   A. 76 s B. 1.76 s C. 2.76 s D. 3.76 s

3. How far away did it land (X) or horizontal distance?
   A. 64.42m B. 75.0 m C. 100.0 m D. 42. 44 m

For numbers 4-5 : A physics book slides off horizontally in teacher's table top with a speed of 1.10 m/s. It strikes the floor in 3.50 s.

4. What is the height of the table above the floor?
   A. 0.25 m B. 0.44 m C. 0.50 m D. 1.5 m

5. What is the horizontal distance from the edge of the table to the point where the book strikes the floor?
   A. 1.0 m B. 1.5 m C. 0.30 m D. 0.39 m

Answer Card

Keys Me!

Activity Card No. 1
Pre- Assessment

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

Activity Card No. 2

Q1. The cotton ball flies farther. The farther you pulled back on the launcher the higher the cotton ball traveled.
Q2. Kinetic energy
Q3. a catapult launching perfectly round.

Activity Card No. 3
Problem No.1

Given: $h = 20.0\ m$
$v_0 = 30.0\ m/s$
Find: $v = ?$

$h = \frac{1}{2}gt^2$
$20.0\ m = \frac{1}{2}(9.8\ m/s^2)\,t^2$
$20.0\ m = (4.9\ m/s^2)\,t^2$
$t^2 = \frac{20.0\ m}{4.9\ m/s^2}$
$t = \sqrt{4.0816\ s^2}$
$t = 2.02\ s$

Using the time, $t = 2.02$ s, we can now solve the horizontal velocity using the equation,

$$R_H = vt$$

Rearranging the equation, we get, $v = \frac{R_H}{t}$. Plugin the known values, we have:

$v = \frac{R_H}{t}$
$= \frac{60.0\ m}{2.02\ s} = 14.85\ m/s$

Problem No.2

Time of flight: $t = \frac{2v_0 \sin\theta}{g}$

$t = \frac{2v_0 \sin\theta}{g} = \frac{2(25\ m/s)\sin 30}{9.8\ m/s^2} = 2.55\ s$

Maximum height reached: $h = \frac{v_0^2 \sin^2\theta}{2g}$

$h = \frac{v_0^2 \sin^2\theta}{2g} = \frac{(25\ m/s)^2 \sin^2(30)}{2(9.8\ m/s^2)} = 7.97\ m$

Horizontal range: $x = \frac{v_0^2 \sin 2\theta}{g}$

$x = \frac{v_0 \sin 2\theta}{g}$
$x = \frac{(25\ m/s)^2 \sin(2\cdot 30)}{9.8\ m/s^2}$
$x = \frac{(25\ m/s)^2 \sin(60)}{9.8\ m/s^2}$
$x = 55.23\ m$

Activity Card No. 4

1. Independent
2. Gravity
3. Increasing
4. Zero
5. Projectiles launched, projectile launched at an angle.

Assessment Card

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

Enrichment Card

1. C
2. C
3. A
4. D
5. B

Reference Card

REFERENCES

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The End

Congratulations! You really learning a lot . Thank you for tracking the hard ways. Bye !

Bear in Mind:

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CURRICULUM VITAE

Name **Yehlen Villegas Bendanillo**

Date of Birth **April 14, 1980**

Place of Birth **Gingoog City**

Educational Attainment

Master's Degree Master of Arts in Education (MAED)

Agusan Colleges Inc.

Collegiate Bachelor of Secondary Education

Major: Physical Science

Gingoog Christian College: 2013-2017

Bachelor of Secondary Education , 87 units

Major: PEHM

Bukidnon State University, 1997-1999

Vocational House Keeping NCII

Global Mindanaw Polytechnic Inc. (GMPI), 2017

Basic Freelance Journalism

International Correspondence School, 2000

Awards Certificate of Recognition - Module Writer Science 8 (Region X)

Certificate of Recognition – DLP (Daily Lesson Plan) Writer Gen. Chem. 11 (Region X)

Certificate of Recognition- Division Finalist of 2020 Search for Outstanding Junior High School Teacher of the Modular Distance Learning Modality (National High School Category)

Work Experiences

2018- Present Secondary School Teacher- Jacinto D. Malimas Sr. National High School

2011- 2012 Freelance Online Writer Essays. Ph

2005- 2010 Property Consultant Camella Homes and Communities (White Gold Reality

2002-2004 Promodizer GV Cosmetics International, Quezon City

Seminars/Training Attended

4 Day Training on STEM:Teach DOST SEI The 7 E's in Teaching Chemistry; August 21-25, 2022

AKADASIA Introduction to Online Teaching; 2021

DOST PHIVOLCS Training for DepEd Teachers on Communicating Volcano, Earthquake and Tsunami Hazards; 2021

16th Session of the Physics Meetup: THE TRAJECTORY OF BREAKING BARRIERS with Aerospace Engineer and Rocket Scientist TIERA FLETCHER, from NASA Space and Rocket Center, Huntsville, Alabama, USA, ; February 27, 2021

SEAMEO Webinar on Developing Flexible and Technology Mediated Learning Programme;2020

Training About Autodesk and Adobe Photoshop for Beginners; 2020

3 Day National Webinar Series “Beyond COVID-19; Implications for Learning, Teaching and Leading;2020

Online Workshop in Transforming Self-learning Modules into Scripts for Radio-based Instruction Through School in the Air; 2020