Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 5 (2026)

Implementation of Revised K-12 curriculum in Science Grade 7 in Malasiqui Junior High School District 1 and 2 Division of Pangasinan 1

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Publication Date: May 9, 2026 DOI: **10.5281/zenodo.20096976**

Abstract

This investigation determined the extent to which the learning competencies were leased and mastered by the learners. The findings revealed that the science of materials was high, life science moderate, force, motion and energy high, and earth and space science was high. There was no difference between the perception of the teachers and school administrators in the implementation of learning competencies in Grade 7 Science, there were more weaknesses than strengths in the implementation of learning competencies. The plan of action was proposed for implementation to enhance the implementation of the learning competencies in Grade 7 Science.

Keywords: *K-12 Curriculum in Science Grade 7*

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 5 (2026)

Chapter 1

THE PROBLEM

Rationale

The Science Shaping Paper is developed to provide the narrative for the development of the recalibrated Science Curriculum. It outlines the goals, theoretical and philosophical foundations, and rationale that shape the Science Curriculum. It presents the big ideas and cross-cutting concepts in Science to emphasize the development of durable understanding among learners as well as skills applicable in various contexts.

The Science Shaping Paper and the Science curriculum are based on the General Shaping Paper, taking into consideration the findings of the curriculum review conducted in 2019-2020. Furthermore, the Science curriculum draws on the goals of the 2016 Science K to 12 curriculum. Its new features include: (a) expanding technological literacy to technology and engineering literacy to enable learners to develop their ability to connect science content to real-world technological and engineering applications; (b) introduction of key stage and grade level standards to articulate expectations of what learners should be capable of doing at each key stage and grade level; and (c) developmental sequence of content in consideration of the prior learning of students and the cognitive and language demands of learning new science ideas. Specifically, in sequencing the science content, three *modes of thinking* have been considered, starting from the simplest level when a person reacts to the physical environment; is able to internalize actions through words and images, and at the most complex level; and is already able to think using a symbol system such as written language and number systems.

The recalibration of the Science curriculum draws from and supports the DepEd MATATAG agenda, which sets the new direction in resolving basic education challenges through the four critical components:

- **MA**king the curriculum relevant to produce competent and job-ready, active, and responsible citizens;
- **TA**king steps to accelerate delivery of basic education facilities and services;
- **TA**king good care of learners by promoting learner well-being, inclusive education, and a positive learning environment; and
- **G**iving support to teachers to teach better.

It comes at a time when rapid changes and disruptions are happening. According to Marope, Griffin, and Gallagher (2017), in the face of such persistent and rapid changes, education, through its curricula, should serve as lifelong learning systems, demonstrating constant self-renewal and innovation.

The succeeding sections are organized as follows:

- The Shape of the Grades 3 to 10 Science Curriculum
- Development of the Curriculum

  - Curriculum Goals, Theoretical and Philosophical Bases, Curriculum Framework, Key Stage Standards, Grade Level Standards
- Elements Contributing to the Curriculum
  - Big Ideas, Cross-cutting Concepts, Developmental Sequence of Concepts, Development of 21st Century Skills, Social Issues and Government Priorities, STEM, Pedagogies, Assessment, and Resources, Curriculum Organization.

The Shape of the Grades 3 to 10 Science Curriculum

The Science curriculum has been developed with the view that science is essential for Filipino learners in an increasingly scientific, technological, and challenging world. Science offers systematic processes and practices to investigate the natural and man-made world and to innovate and to collaborate with other people to explore frontiers and challenges, and to look for solutions to real-world problems. It offers a well-established and reliable body of knowledge that is increasingly accessible to all and at a range of conceptual levels. Science offers unique ways of thinking and acting in everyday social settings, as well as in more technical and professional settings. It offers ways to exhibit values and attitudes to contribute to an improved world.

The Science curriculum supports Filipino learners to engage with science-related issues, and with the ideas of science, as a reflective citizen. It supports them to explain phenomena scientifically, evaluate and design scientific inquiry, and interpret data and evidence. It encourages and supports them to apply scientific, environmental, technological, and engineering knowledge, practices, and principles in the context of real-life situations.

Development of the Curriculum

A. Curriculum Goals

The overall goal of the Grades 3 to 10 Science curriculum is the achievement of scientific, environmental, and technology and engineering literacy of all learners.

On achieving the outcomes of the curriculum, learners will be ready to actively participate in local, national, and global contexts and make meaningful contributions to a dynamic, culturally diverse, and expanding world. By successfully completing the Science curriculum, Filipino learners will demonstrate capabilities as put forth in the Basic Education Development Plan (BEDP) 2030.

B. Theoretical and Philosophical Bases

The Science curriculum presents a modern outlook incorporating learning approaches drawn from an increasingly expanding body of worldwide education research and education experience that recommend that science curricula and the teaching and learning of science for the elementary and secondary years focus on engaging learners in scientific inquiry and the nature and practice of science.

The Enhanced Basic Education Act of 2013 (RA 10533), Section 5.e requires that the curriculum support and reflect universally recognized theories of learning, particularly *Constructivism*. Other theories contributing to the development of the

Science curriculum include *Social cognition theory, Brain-based theories of learning,* and *Vygotsky's Zone of Proximal Development (ZPD).*

The ***Constructivist theory of learning*** suggests that learners learn by expanding their knowledge based on their prior knowledge. One of the primary goals of using constructivist teaching is for learners to learn how to learn when they are trained to take the initiative for their own learning experiences. Therefore, learners learn best when they can construct a personal understanding based on experiencing things and reflecting on those experiences. Constructivism emphasizes the active role of learners in building their own understanding. Rather than passively receiving information, learners reflect on their experiences, create mental representations, and incorporate new knowledge into their schemas, thus promoting deeper learning and understanding.

The **Social Constructivist Theory** advocated by Vygotsky posits three important ideas on the processes of learning and development of an individual. First, these processes involve co-construction with others. Social interaction plays a key role in shaping what learners know (cognition). Second, language mediates the learning process as they communicate with others, which includes not only verbal but also non-verbal communication. Knowledge and concepts are conveyed in the language and modes of communication we use. And third, learning and development take place within cultural and historical contexts. This means that learners' participation in the classroom and in school is also influenced by other institutions in which they participate, such as their home and community. There is a need to accommodate learners' diverse backgrounds, acknowledging their development as whole persons and tapping into their everyday practices, emotions, and identities.

Vygotsky's Zone of Proximal Development (ZPD) refers to the difference between what a learner can do without help and what he or she can achieve with guidance and encouragement from a skilled partner. The term 'proximal' suggests that area where the learner is 'close' to grasping the knowledge or skills to be learned. It recommends that learning occurs best in the ZPD – the zone where instruction is the most beneficial – where the task is only just beyond the individual's capabilities. An important process: therefore, is for the teacher to identify what the learner already knows and can do so the teacher can provide the 'close to' environment. Successful scaffolding thus requires appropriate selections, thoughtful organization, and sensitive presentation of suitable tasks.

The Science curriculum acknowledges the learners' direct interaction to their environment through assimilation and reinforcement as a crucial factor in learning and knowledge acquisition. ***The Social cognition learning model*** suggests that "most human behavior is learned observationally through modeling," thus, learners can learn from observing others either as a live model, a symbolic model, or a verbal instructional model. This pedagogical theory explains as well how attention, retention of ideas, reproduction of skills, and motivation, are influenced by how learners observe others and their experiences as they interact in their social and media environment.

The ***Brain-based learning theory*** is a relatively new educational theory that puts premium on the recent research about cognitive and neurosciences on how the brain learns and how learners learn differently as they age, grow, and mature cognitively, emotionally, and socially. It strongly suggests that learning can be improved and accelerated if teachers structure educational experiences in the classroom to reflect conditions that facilitate learning and improve brain functions and health and deliver lessons based on the science of learning.

The **Cognitive load theory** is a theory of how human brains process, learn and store information. The theory suggests that working memory has a limited capacity and that overloading it reduces the effectiveness of teaching. Furthermore, Dylan William has described cognitive load theory as “the single most important thing for teachers to know” (William 2017). A large body of research evidence indicates that instruction is most effective when designed according to the limitations of working memory.

C. Science Curriculum Framework

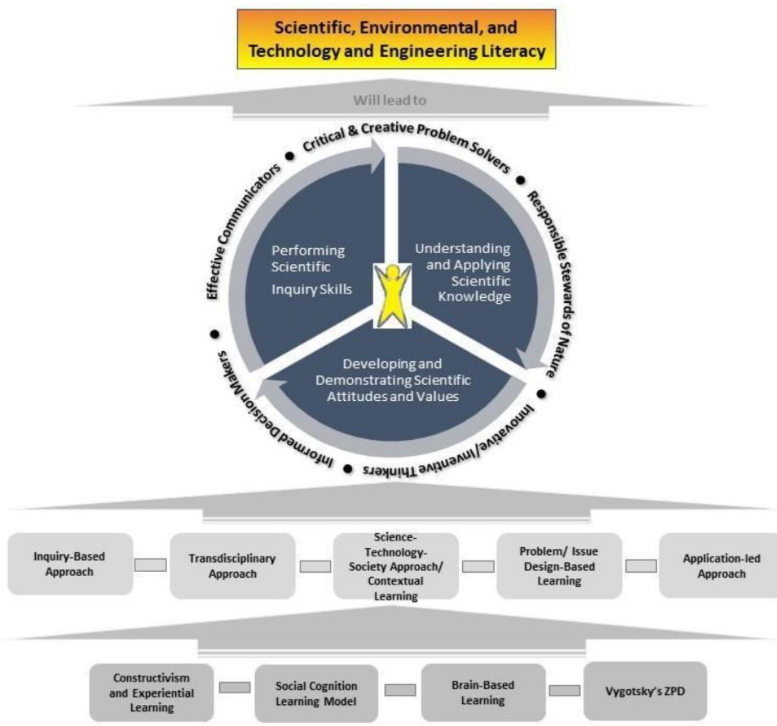

Figure 1. Science Curriculum Framework

A central feature of the Science curriculum is the balanced integration of three interrelated content strands:

- ***Performing scientific inquiry skills;***
- ***Understanding and applying scientific knowledge; and***
- ***Developing and demonstrating scientific attitudes and values***.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 5 (2026)

This content is structured into a developmental sequence of science content, which progressively increases in conceptual demand. The design supports learners to engage with and learn in science appropriate to the expected prior experiences and learning.

To support the achievement of the developmental sequence, the Science curriculum has cross-disciplinary opportunities for learning built into learning competencies to reinforce the knowledge and understanding, skills and processes, and values and attitudes content included in the domains for a grade level or stage.

The learning of this content is principally facilitated using ***the inquiry approach***, supported through approaches that challenge learners according to their prior learning and needs.

> *Participation in scientific inquiry enables students to develop ideas about science and how ideas are developed through scientific activity. The key characteristic of such activity is an attempt to answer a question to which students do not know the answer or to explain something they do not understand. The answer to some questions can be found by first-hand investigation, but for others information is needed from secondary sources. Therefore, capabilities involved in conducting scientific inquiry have a key role in the development of big ideas.*

From *Harlen*, W. (Ed.) *Working with big ideas of science education*; (2015)

Other approaches that enhance inquiry learning and have also contributed to the curriculum design include:

- ***applications-led learning,***
- ***the science-technology-society approach,***
- ***problem-based learning, and***
- ***multi-disciplinary learning***.

The Science curriculum adopts in a developmental way the ***Big Ideas*** (Harlen, et al. 2015) and ***Crosscutting Concepts* of Science** (A Framework for the K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas, 2012), as well as integrates government priorities identified as appropriate to the science learning area.

The Science curriculum recognizes the place of science and technology in everyday human affairs. It integrates science and technology in the social, economic, personal, and ethical aspects of life. The science curriculum promotes strong links between science and technology, including indigenous know-how in the use of natural materials, thus contributing to the preservation of the country's cultural heritage.

The three areas of **knowledge and understanding**, **skills and processes**, and **values and attitude** are intertwined within the learning competencies in the Science curriculum as these are best learned in context. This reduces the load on the teacher to find matching skills, processes, and values and attitudes for the concepts to produce authentic activities.

Organizing the curriculum around situations and problems that challenge and activate learners' curiosity motivates them to engage and appreciate science as relevant and useful.

The intention of the curriculum is not to rely solely on textbooks, but to engage learners in science, as well as technological and engineering-related practices and processes and to incorporate varied hands-on and minds-on activities to develop learners' interest and encourage them to be active learners. Where learning competencies suggest engagement with and demonstrations of knowledge and understanding, this curriculum sets the expectation that learners will actively engage in locating and interpreting the relevant scientific facts, concepts, laws, and theories, and reinterpret or represent them as a deliberate learning strategy. This approach is strongly supported in brain-based learning, which suggests that teachers can promote higher learning through guidance with questions rather than by requiring learners to rote learn.

The Science curriculum is designed to be learner-centered and inquiry-based, emphasizing the use of evidence in constructing explanations and providing opportunities for collaboration, innovation, creative scientific exploration, and engineering design. The curriculum explicitly presents many learning competencies that require active learner participation and leadership. Thus, teachers should also deliberately look for opportunities to apply inquiry learning when addressing any learning competency, as this models the nature and practice of science in authentic scientific research and enterprise.

Assessment is an integral part of teaching and learning. The curriculum is designed to progressively introduce science concepts and skills and build towards learning of more conceptually complex content. For that reason, it is crucial that the prior experiences, knowledge, and understanding of learners are considered and assessed in formative ways to ensure that an accessible but challenging level of teaching and learning is offered to learners, maximizing the effectiveness of instruction (Vygotsky, 1978). Further information about assessment is described in the last part of this paper.

The Science curriculum provides learners with a repertoire of competencies for lifelong learning, for the world of work, and playing part in a well-informed society. It envisions learners with scientific, environmental, and technology and engineering literacy. Learners will be productive members of society because they are critical and creative problem solvers, responsible stewards of nature, innovative/inventive thinkers, informed decision makers, and collaborative and effective communicators.

The curriculum provides *Content standards* for each Domain and Grade to support teachers to identify the level of science knowledge, skills, and values to be taught and learned. It also clearly articulates *Performance standards* to support the teacher to assess the levels of knowledge, skills, and values that learners demonstrate in relation to the *Content* and *Learning Competencies* addressed during and at the end of each quarter of teaching and learning.

The Science curriculum is structured using the following organizers:

- ***Content*** – signaling the key areas of focus for a Quarter;
- ***Content Standards*** – indicating the conceptual level expected for the Quarter;

- ***Learning Competencies*** – identifying the specific aspects of content for learners to achieve;
- ***Performance Standards*** – providing a level for teachers to use to judge learner achievement at the end of each quarter; and
- ***Performance Tasks*** – samples of tasks where the learner applies their knowledge, understanding, skills and processes, values and attitudes, through which teachers can judge the levels of achievement of the performance standard for each quarter in the domain.

Elements Contributing to the Science Curriculum

A. Big Ideas

The concepts and skills of Science are not taught in isolation, but rather in the context of big ideas in Science with increasing levels of complexity from one grade level to another in developmental progression, thus paving the way to a deeper understanding of core concepts. The integration across science domains leads to a meaningful understanding of interrelated concepts and their applications in real-life situations.

One of the reported findings from the curriculum review is that the curriculum is congested – that there is an unequal distribution of learning competencies across different cognitive demands and grade levels. Specifically, there are many learning competencies on the cognitive demands communicating understanding of science concepts and analyzing information and advance scientific arguments. To address this issue, the learning standards are redesigned with a focus on the Big Ideas, and the content standards are progressively appropriate for each grade level. Additionally, the learning competencies ensure a comparable distribution of cognitive demands across different cognitive domains and grade levels, for the learners to learn to perform basic procedures before undertaking the more cognitively demanding competencies.

A *Big Idea* is a statement of an idea that is central to learning – one that links numerous understandings into a coherent whole. It also represents a progression towards understanding key concepts in different learning areas (Charles, 2005). Grounding the learner's content knowledge on a relatively few Big Ideas establishes a robust understanding of the learning area. The connection of Big Ideas to many other ideas allows the learner to see it as a set of interrelated concepts, skills, and facts thus, promoting memory and enhancing transfer.

B. Crosscutting Science Concepts

Crosscutting concepts are described as "dimensions that unify the study of science and engineering through their common application across fields." (*A Framework for K-12 Science Education Practices, Crosscutting Concepts, and Core Ideas,* National Academy of Sciences, 2012)

Research suggests that learners, over multiple years of school, actively engage in science and engineering practices and apply crosscutting concepts to deepen their

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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understanding of each field's disciplinary core ideas.

The Science curriculum recognizes the importance of utilizing internationally accepted crosscutting ideas that recur across the different science domains and across grade levels. These crosscutting concepts include the following:

- *Structure and function,*
- *Stability and change,*
- *Systems and system models,*
- *Energy and matter: flows, cycles, and conservation,*
- *Scale, proportion and measurement,*
- *Patterns,*
- *Cause and effect,* and
- *The nature and practices of Science*.

Crosscutting concepts connect the small ideas in the different science domains as the learning areas are introduced in every quarter.

C. The Developmental Sequence of Concepts

The Science curriculum has been structured to progressively develop conceptual understanding of science ideas and practices by carefully paying attention to the introduction of new ideas. It is cognizant of the following important factors that influence students' readiness to learn science ideas and practices:

1. The experiences and expected prior learning of students;
2. The stages of development of students as described in educational research (that learners progress through *modes of thinking* from birth to adulthood: from *sensorimotor* to iconic to *concrete symbolic*, to *formal* and finally to *post-formal*.);
3. The cognitive demand of new science ideas for learners;
4. The language demands associated with new ideas in science; and
5. The need to reinforce new ideas within and across science domains in a consistent manner.

The Science curriculum for Grades 3 to 10 particularly responds to the first three *modes of thinking* to inform the sequencing of science content. The ***Sensorimotor*** mode identifies the developmental stage when a person reacts to the physical environment. For a very young child, it is the mode in which motor skills are acquired. In adult life, this mode is utilized as skills associated with sports and other physical activities that develop and evolve. The ***Iconic*** mode identifies when a person can internalize actions in the form of images. It is in this mode that the young child develops words and images that represent objects and events. For the adult, this mode of functioning assists in the appreciation of art and music and leads to a form of knowledge referred to as intuitive. The ***Concrete symbolic*** mode identifies when a person thinks using a symbol system such as written language and number systems. Thinking in this mode is reliant on a 'real-world' referent. This is the most common mode addressed in learning in the upper primary and secondary school (Biggs & Collis, 1982).

The design of the Science curriculum promotes interactive, concrete, and hands-on instructional approaches in the early grades, especially in the introduction of more difficult concepts. The delivery of a lesson will call for activating prior knowledge in which new learning is built over prior learning. The presentation of content follows a progression from Grade 3 to Grade 10 towards the scientific, environmental, and technology and engineering literacy of all learners.

a. Vertical Articulation

The various concepts, processes, and skills in the four domains of the Science curriculum are arranged in an increasing level of complexity from Grade 3 to Grade 10. It reinforces new ideas through the use of the development of key ideas towards the developmentally through the various domains.

The progression of concepts across grade levels provides an opportunity for the development of understanding of key science concepts. This is fundamental to the process whereby learners construct their understanding and skills. Since science is taught as a separate learning area from Grade 3, the learning standards leading to the acquisition of good health habits and the development of curiosity about self and the environment using basic process skills in Grades 1 and 2 are articulated in other learning areas.

b. Horizontal Articulation

The learning of science is interconnected with other learning areas especially languages and mathematics. The foundational skills, especially literacy and numeracy, introduced in the other learning areas are paramount to the understanding and acquisition of concepts and skills in science. These basic skills, together with the other essential skills, such as communication, collaboration, and critical thinking, ensure not only the learning of science content but also address and establish connections and applications in other learning areas. Linking science with literacy and numeracy is vital to fill in the gaps where the learners' knowledge and skills may be inadequate.

The curriculum also makes use of the interconnection between science and the other learning areas such as Edukasyong Pantahanan at Pangkabuhayan/Technology Livelihood Education (EPP/TLE), Araling Panlipunan (AP), the language subjects, and Mathematics, among others. Analysis of factors affecting the Program for International Student Assessment (PISA) performance of Filipino learners has shown that the development of problem solving, critical thinking, and information literacy in subject areas such as Araling Panlipunan, English, and Filipino is related to the development of the same set of 21st century skills in Science.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
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D. Development of the 21st Century Skills

One of the daunting challenges of 21st century education is to respond to the needs and demands of this fast-paced dynamic world. Accelerated digitalization and artificial intelligence, shifting job market demands, information explosion, pressures of global competitiveness, and transforming scientific innovations and technological advancements redefine the knowledge, skill and competency sets that the next generation of learners must be equipped with to be adequately prepared.

The Department of Education (DepEd) recognizes and responds to these needs and demands through appropriate changes in the educational system. DepEd also continues to respond to the challenges through the refinement of the K to 12 curricula to produce holistically developed Filipino learners with essential 21st century knowledge and skills needed to participate in and provide significant contributions to society and to nation-building.

21st Century Skills are the knowledge, skills, attitudes, and competencies that learners need to develop so that they can prepare for and succeed in work and life in the 21st century (DepEd Order No. 21, s. 2019). It also refers to the knowledge, skills and attitudes necessary to be competitive in the 21st century workforce, participate appropriately in an increasingly diverse society, use new technologies and cope with rapidly changing workplaces (Binkley *et al.* 2012; Scoular and Care, 2018). These skills are transversal in nature and work in conjunction with foundational literacy and numeracy skills and discipline-specific competencies (e.g., scientific literacy).

Every K to 12 graduate is expected to be equipped with 21st Century Skills which include the following:

(a) Information, Media, and Technology skills – the ability to gather, manage, evaluate, use, and synthesize information through media and technology. These skills allow learners to navigate a fluid and dynamic environment of knowledge creation and acquisition. Among the skills and competencies that the science curriculum emphasizes include *Visual, Information, Technology,* and *Digital literacies*.

(b) Learning and Innovation skills – the ability to think critically, analyze and solve problems, create and implement innovations, and generate functional knowledge. The science curriculum highlights *Creativity, Openness, Critical thinking, Problemsolving,* and *Reflective thinking.*

(c) Life and Career skills – prepares learners to make informed life and career decisions to enable them to become citizens that engage in a dynamic global community and to successfully adapt to meet the challenges and opportunities to lead in the global workforce. The science curriculum helps develop *Informed decision-making, Self-discipline, Future orientation,* and *Resilience and adversity management*.

(d) Communication skills – the ability to express oneself clearly and collaborate with

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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others. The science curriculum puts premium on communication skills including all forms and context including but not limited to verbal and non-verbal, active listening, as well as the abilities to express feelings and provide feedback. The science curriculum focuses on the development of the sub-skills: *Teamwork, Collaboration, Intrapersonal skills, Interactive communication,* and *Communicating in a diverse environment.*

E. Social Issues and Government Priorities

The Science curriculum contributes to the achievement of government priorities to address current social issues by integrating developing learners' awareness in relation to those aspects of the content that are most applicable and provide authentic significance for learners. The common goal is achieved by bringing relevant issues and applications to curriculum learning contexts in science to support learners to develop their understanding, skills, and values and attitudes towards becoming responsible and productive citizens.

Science, as a discipline, puts premium on the investigation of natural phenomena and as such addresses and contributes to the goals of the many government priorities, which include the following:

- Reduction and management of risks and disaster;
- Fighting against climate change;
- Environmental protection and conservation;
- Sustainable development of resources and energy, including the Green economy, Renewable energy, Sustainable mining; and
- Comprehensive Sexuality Education (CSE).

F. STEM

Science, Technology, Engineering and Mathematics (STEM) is a government priority and is significant in the development of problem solvers, innovative thinkers, and entrepreneurs who can contribute to inclusive economic development. As depicted in the STEM Framework, this development is achieved through three learning areas in the K to 12 curriculum – Science, Mathematics, and Technology and Livelihood Education (TLE), which may collectively employ the Engineering Design Process (EDP) to attain curriculum goals. Though distinct and taught separately, these three learning areas are interrelated, and each contributes knowledge and skills for the solution to real-world problems. Figure 2 shows a diagrammatic representation of the STEM Framework.

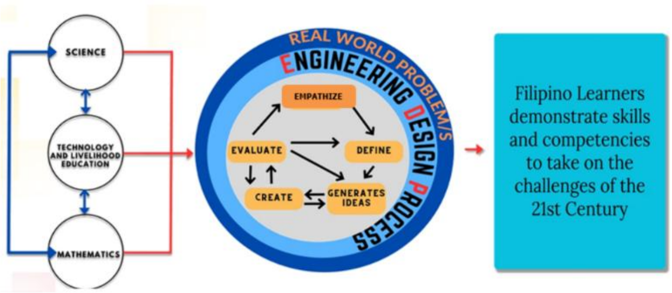

Figure 2. STEM Framework

Utilizing the EDP in the instruction allows learners to design solutions based on understanding the needs and contexts, build and test solutions, repeat steps as many times as needed to make improvements, learn from unsuccessful attempts, and discover different or novel design possibilities to arrive at optimal solutions. In the curriculum, EDP is exhibited through problem solving and investigative approaches where learners apply their mathematical, scientific, and technological understanding to formulate, conjecture, reason, create, and evaluate.

G. Pedagogies, Assessment, and Resources

The Science Curriculum Framework identifies the pedagogies that the curriculum embraces to improve learning in science for Filipino learners. These pedagogical approaches can be included appropriately by teachers in the delivery of science lessons to adapt to the learners' context and learning environment. These approaches are described below to guide teachers in using each pedagogical approach.

Inquiry-based learning approach puts a premium on questioning, investigating, proving, probing, explaining, predicting, and establishing connections of evidence (Calburn, 2020). Instead of a transmissive mode of teaching, this approach involves inquiry and sustained active engagement of learners. The approach is characterized in the classroom by questions and discussions. Inquiry allows learners to formulate questions and find solutions through learning real-life-based investigations and research projects. Concepts and specific scientific terms need to be explained in simple language. Applications and situations need to be explained in relevant contexts and are best explored through science activities. In this approach learners also engage in developing process skills, analyzing, and evaluating evidence, experiencing and discussing, and talking to their peers about their own understanding (Suchman, 1964). Learners collaborate with others to make discoveries, solve problems, and plan investigations.

An ***applications-led approach*** suggests that it is useful to consider the application of the concept rather than of an approach based on the traditional logic of the discipline. Applications-led approach means that the science to be taught is determined by applications from life and NOT by the logic of the discipline of science. Although this curriculum does not suggest an applications-led approach for the entire curriculum, the inclusion in each quarter in each of the domains of learning of suggested Performance Tasks is intended to reflect the importance given to the expectation that the learners demonstrate how their learning can be applied to their everyday lives.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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The Science Technology Society approach (STS) focuses on the societal role of science and technology in the contemporary and modern world. It provides a dynamic and interdisciplinary relationship of history, philosophy and sociology including cultural perspectives to answer and respond to current science concerns, issues and problems (Pritchard & Woollard, 2010). By using this approach, the learners expand their understanding of science across disciplines and holistically view problems by examining the consequences of science and technology.

Problem-based Learning approach (PBL) is the acquisition of knowledge and skills using critical thinking and creativity to solve real-life problems. In this approach, real-world problems motivate learners to seek out deeper understanding of concepts, design reasoned decisions and defend them, and collaborate among themselves (Duch et al., 2001). Through this approach, development of critical thinking, problem-solving abilities, and collaboration and communication skills, are essentially given a focus. An effective and versatile approach for PBL is design thinking or engineering design process, which can be used to generate solutions based on the needs of intended users.

A ***multidisciplinary*** **(*cross-disciplinary)*** design is built into the Science curriculum. A multidisciplinary approach is defined by UNESCO as "*curriculum integration which focuses primarily on the different disciplines and the diverse perspectives they bring to illustrate a topic, theme or issue. A multidisciplinary curriculum is one in which the same topic is studied from the viewpoint of more than one discipline*." The Science curriculum lends itself to greater integration of disciplines as may be adopted in some schools. Similarly, UNESCO defines a ***transdisciplinary approach*** as "*an approach to curriculum integration which dissolves the boundaries between the conventional disciplines and organizes teaching and learning around the construction of meaning in the context of real-world problems or themes.*" An ***interdisciplinary approach*** is defined as "*An approach to curriculum integration that generates an understanding of themes and ideas that cut across disciplines and of the connections between different disciplines and their relationship to the real world. It normally emphasizes process and meaning rather than product and content by combining contents, theories, methodologies, and perspectives from two or more disciplines.*"

Assessment for the Science Curriculum

1. **Classroom Assessment** is an ongoing process of identifying, gathering, organizing, and interpreting quantitative and qualitative information about what learners know and can do (DepEd Order 31, s. 2020).

   The alignment of assessment to curriculum and pedagogy ensures that assessments are fair, valid and reliable in judging, providing feedback, and adjusting for the cognitive progress of the learners. *Appropriate assessment shall be employed to holistically measure the learners' current and developing abilities while developing personal accountability in the process* (DepEd Order 8, s. 2015).

Assessment for the Science curriculum should be organized to:

- identify prior learning and to set goals for learning;

- support learners explicitly to take an active role in assessing and evaluating their learning; and
- judge the level of achievement of the learners against the content, performance and grade standards of the intended learning.

As instruction for the Science curriculum is expected to be inquiry-based, it is critical that before addressing the learning competencies for that quarter the teacher identifies what the learners already know and can do. This may or may not be through formal assessment tasks but should provide the information needed to properly plan learning activities for individual learners and the class overall. These types of assessment may be used any time during inquiry-based science instruction to check on understanding of scientific concepts, verify the development of scientific inquiry, and reiterate the Science process skills. Assessment to check on learners' learning also provides a process to provide feedback and adapt to the needs of the learner, thus allowing the teacher to adjust instruction to meet learners' ever-changing needs.

2. Performance Tasks and Standards

The Science curriculum requires learners to complete at least one substantial performance task for each quarter. These may be through independent or collaborative work. The curriculum provides Performance Standards along with sample tasks to guide teachers on the performance level expected. The levels of learner performance are judged using criteria suitable for the task.

The Performance standards, which are closely aligned with the Content Standards, provide a mechanism for teachers to make judgements on how well learners are applying science knowledge and understanding, skills and processes, and values and attitudes described in the curriculum content.

Performance Tasks and Standards assist the teachers and learners to answer the questions:

1. "What do learners do with what they know?"
2. "How well do learners demonstrate their learning?"
3. "How well do learners apply their learning in different situations, including in real-life contexts?"
4. "What tools and measures and values do learners use or draw on to demonstrate what they know?"

Resources and Technologies

The implementation of the Science curriculum can be delivered across available learning delivery resources. The teaching and learning process is not limited to face-to-face. The curriculum allows the adoption of a distance or blended learning approach.

Teachers may need to change their usual practice of instruction – they would have to be familiar with the pedagogical and technological demands of these new learning approaches.

There are several innovative teaching methods and technological tools that should be introduced appropriately in basic science education. These emerging methodologies, strategies and tools should be appropriately chosen, and integrated into the science lessons to fit learners' cognitive abilities and classroom contexts. Among these innovative teaching methods and tools which can be applied to science are design thinking and engineering design processes, robotics technology, mobile learning applications, learning analytics, games and gamification, and virtual and remote laboratories. Teaching methods and strategies should cater to the needs, skills, and contexts of diverse learners. The Department of Education will continually assess and evaluate the applicability of these emerging approaches.

H. Curriculum Organization

The Science curriculum is organized into discipline-oriented domains.

The domains for Grades 3-6 are:

- *Materials*
- *Force, Motion, and Energy*
- *Living things; and*
- *Earth and space.*

The domains for Grades 7-10 are:

- *Science of Materials*
- *Force, Motion, and Energy*
- *Life Science; and*
- *Earth and Space Science.*

The learning competencies in the Science curriculum are written as statements of what learners know and can do. They signal learning activities that require active learner participation using an inquiry approach to deliver deep learning.

Teachers are encouraged to develop learning activities and opportunities that progressively build conceptual understanding,

skills, values, and attitudes within domain quarters by considering the learning competencies holistically, rather than as a list of things/content to cover.

Over a grade, teachers are encouraged to develop learning activities and opportunities that connect with and draw on content from other domain quarters.

The science curriculum provides cross-domain alignment of significant science knowledge, skills, processes and attitude related contexts and competencies to allow learners to apply and reinforce learning in varying contexts throughout each year and key stage.

LEARNING AREA STANDARDS

Science Curriculum Overview

The Science curriculum provides learners with a repertoire of competencies important for lifelong learning and in the world of work in a skill-based society. It envisions the development of ***scientifically***, ***environmentally***, and ***technology literate learners*** who are productive members of society and who are *critical problem solvers*, *responsible stewards of nature*, *innovative and creative citizens*, *informed decision makers*, and *collaborative and effective communicators*.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
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A central feature of the Science curriculum is the balanced integration of three interrelated content strands:

- *Performing scientific inquiry skills,*
- *Understanding and applying scientific knowledge, and*
- *Developing and demonstrating scientific attitudes and values*.

It is designed and organized through the integration of the three interrelated content strands. The acquisition of these content strands is facilitated by drawing from the key pedagogical approaches: ***inquiry-based learning, applications-led approach, the science-technology-society approach, problem-based learning, and multi-disciplinary learning.*** The approaches are based on sound and valued educational research and concepts including *Constructivism*, the *Social Cognition*

Learning Model, *Brain-based Learning* and *Vygotsky's Zone of proximal development*.

The Science curriculum explicitly adapts in a developmental way *Big Ideas* (Harlen, et al., 2015) and Cross Cutting Concepts of Science (A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas, 2012), and integrates governmental thrusts of the Philippines identified as appropriate to the science learning area. The science curriculum recognizes the place of science and technology in everyday human affairs. It integrates science and technology in the social, economic, personal, and ethical aspects of life. The science curriculum promotes a strong link between science and technology, including indigenous technology, thus preserving our country's cultural heritage.

Science concepts and science processes are intertwined through the learning competencies in the Science G3 to G10 curriculum. A learner-centered and inquiry-based approach facilitates the acquisition of science concepts. Organizing the curriculum around situations and problems that challenge and stir up learners' curiosity motivates them to learn and appreciate science as relevant and useful. Rather than relying solely on textbooks, a variety of hands-on, minds-on, and hearts-on activities are advocated to develop learners' interest and lead them to becoming active learners to acquire deep knowledge for applying 21st Century Skills.

Grade 7

At the end of Grade 7, learners use models to describe the Particle theory of matter. They use diagrams and illustrations to explain the motion and arrangement of particles during changes of state. They explain the role of solute and solvent in solutions and the factors that affect solubility. They demonstrate skills to plan and conduct a scientific investigation making accurate measurements and using standard units. Learners describe the parts and functions of a compound microscope and use this to identify cell structure. They describe the cell as the basic unit of life and that some organisms are unicellular and some multicellular. They explain that there are two types of cell division, and that reproduction can occur through sexual or asexual processes. They use diagrams to make connections between organisms and their environment at various levels of organization. They explain the process of energy transfer through trophic levels in food chains.

Learners use systems to analyze and explain natural phenomena and explain the dynamics of faults and earthquakes. They identify and assess the earthquake risks for their local communities using authentic and reliable secondary data. They use national and local disaster awareness and risk reduction management plans to identify and explain to others what to do in the event of an earthquake and/or tsunami. Learners explain the cause and effects of secondary impacts that some coastal communities may experience should a tsunami be produced by either a local or distant earthquake. Learners identify and explain how Solar energy influences the atmosphere and weather systems of the Earth and that these are the dominant processes that influence the climate of the country.

Learners employ scientific techniques, concepts, and models to investigate forces and motion, and describe their findings using scientific language, force diagrams, and distance-time graphs. They use their curiosity, knowledge and understanding, and skills to propose solutions to problems related to motion and energy. They use scientific investigations to describe the properties of heat energy. They apply their knowledge and problem-solving skills in everyday situations and explore how modern technologies may be used to overcome current global energy concerns.

Statement of the Problem

This study, determines the extent of the implementation of K-12 Curriculum in Grade 7 Science in Malasiqui District 1 and 2 in Malasiqui, Division of Pangasinan I this school year 2025 – 2026.

Specifically, it seeks answers to the following related questions:

1. What is the extent of learning competencies of Revised K-12 Curriculum in Grade 7 Science in Malasiqui District 1 and 2 as perceived by the Grade 7 Teachers and their School Administrators along:

   (1st Q) Science (a) Use models (b) the particle model and the changes of state (c) planning following and recording scientific investigation (d) solutions, solubility, and concentration.

   (Please use the learning competence of every quarter)

   Second quarter Life Science

   a. Science equipment the compound microscope
   b. Plant and animal cells
   c. Cellular reproduction
   d. Levels of biological organization
   e. Trophic levels and transfer of energy

   Third Quarter Free Motion, and Energy

   a. Balance and Unbalance forces
   b. Motion displacement velocity
   c. Distance – Time graphs
   d. Identifying and Controlling visually
   e. Heat transfer

Fourth quarter (Earth and Space Science)

a. System models
b. Earthquakes
c. Sum influence on earth

2. Is there a significant difference between the perceptions of the Grade 7 Science Teachers and their administrators on the extent of implementation of the Revised K-12 Curriculum in Grade 7 Science along the different dimension from the four quarters?

3. What are the strengths and weaknesses of the teachers in the implementation of Grade 7 Science Revised k-12 Curriculum?

4. What are the factors that negatively affect the implementation of the Revised k-12 Grade 7 Curriculum in the public schools Grade 7 Science in Malasiqui District 1 and 2.

Hypothesis

The research was tested at .05 level of significance.

1. There is no significant difference between the extent of the teachers and their school administrators in the implementation of Revised K-12 Curriculum in Grade 7 Science.

Definition of Terms

The curriculum organizers described below are used together to form the curriculum description in the Grades 3 to 10 Science Curriculum Guide. The definitions within this section are drawn from DepEd Order No. 8, s. 2015 and DepEd Order No. 21, s. 2019.

1) **Standard** – In its broadest sense, it is something against which other things can be compared to for the purpose of determining accuracy, estimating quantity or judging quality. It is a stated expectation of what one should know and be able to do.

2) **Key Stage** – This refers to stages in the K to 12 Program reflecting distinct developmental milestones. These are Key Stage 1 (Kindergarten – Grade 3), Key Stage 2 (Grades 4 – 6), Key Stage 3 (Grades 7 – 10), and Key Stage 4 (Grades 11 and 12).

3) **Key Stage Standard** – This shows the level or quality of proficiency that the learner is able to demonstrate in each key stage after learning a particular area in relation to the core learning area standard.

4) **Grade Level Standard** – This shows the level or quality of proficiency that the learner is able to demonstrate in each Grade after learning a particular area in relation to the core learning area standard.

5) **Content Domain** – This is a particular strand or domain of the curriculum in which the scope and sequence of a set of related topics and skills are covered.

6) **Content Standard** – The content standards identify and set the essential knowledge and understanding intended to be learned. They cover a specified scope of sequential topics within each learning strand, domain, theme, or component. Content standards answer the question, "What should the learners know?"

7) **Learning Competency** – This refers to a specific skill performed with varying degrees of independence. It has different levels of difficulty and performance levels. It also refers to the ability to perform activities according to the standards expected by drawing from one's knowledge, skills, and attitudes.

8) **Performance Standard** – The performance standards describe the abilities and skills that learners are expected to demonstrate in relation to the content standards and the integration of 21st century skills. The integration of knowledge, understanding, and skills is expressed through creation, innovation, and adding value to products/performance during independent work or in collaboration with others.

SEQUENCE OF DOMAIN PER QUARTER

	Elementary				**Junior High School**			
	Grade 3	**Grade 4**	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**	**Grade 9**	**Grade 10**
First Quarter	Materials	Materials	Materials	Materials	Science of Materials	Life Science	Force, Motion, and Energy	Earth and Space Science
Second Quarter	Living Things	Living Things	Living Things	Living Things	Life Science	Science of Materials	Earth and Space Science	Force, Motion, and Energy
Third Quarter	Force, Motion, and Energy	Force, Motion, and Energy	Force, Motion, and Energy	Force, Motion, and Energy	Force, Motion, and Energy	Earth and Space Science	Life Science	Science of Materials
Fourth Quarter	Earth and Space	Earth and Space	Earth and Space	Earth and Space	Earth and Space	Force, Motion, and Energy	Science of Materials	Life Science

GRADE 7 – QUARTER 1: SCIENCE OF MATERIALS

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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Content	Content Standards Learners Learn that:	Learning Competency The learners…
1. Use of models 2. The Particle model and changes of state 3. Planning, following, and recording scientific investigations 4. Solutions, solubility, and concentration	1. Scientists use models to explain phenomena. 2. The particle model explains the properties of solids, liquids, and gases and the processes involved in changes of state. 3. Diagrams and flowcharts are very useful in demonstrating and explaining the motion and arrangement of particles during changes of state. 4. There are specific processes for planning, conducting, and recording scientific investigations. 5. The properties of solutions such as solubility and reaction to litmus determine their use.	1. recognize that scientists use models to explain phenomena that cannot be easily seen or detected; 2. describe the Particle Model of Matter as “All matter is made up of tiny particles with each pure substance having its own kind of particles.”; 3. describe that particles are constantly in motion, have spaces between them, attract each other, and move faster as the temperature increases (or with the addition of heat); 4. use diagrams and illustrations to describe the arrangement, spacing, and relative motion of the particles in each of the three states (phases) of matter; 5. explain the changes of state in terms of particle arrangement and energy changes: a. solid → liquid → vapor, and b. vapor → liquid → solid; 6. follow appropriate steps of a scientific investigation which includes: a. Aim or problem, b. Materials and

		equipment, c. Method or procedures, d. Results including data, and e. Conclusion. 7. make accurate measurements using standard units for physical quantities and organize the collected data when carrying out a scientific investigation; 8. identify the role of the solute and solvent in a solution; 9. express quantitatively the amount of solute present in a given volume of solvent; 10. demonstrate how different factors affect the solubility of a solute in a given solvent, such as heat; 11. identify solutions, which can be found at home and in school and that react with litmus indicator, as acids, bases, and salts; and 12. demonstrate proper use and handling of science equipment.
Performance Standard *By the end of the Quarter, learners* recognize that scientists use models to describe the particle model of matter. They use diagrams and illustrations to explain the motion and arrangement of particles during changes of state. They demonstrate an understanding of the role of solute and solvent in solutions and the factors that affect solubility. They demonstrate skills to plan and conduct a scientific investigation making accurate measurements and using standard units.		
Suggested Performance Task		

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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Design and carry out an investigation to determine the amount of salt in a sample of seawater.

GRADE 7 – QUARTER 1: SCIENCE OF MATERIALS		
Content	**Content Standards** **Learners Learn that:**	**Learning Competency** **The learners…**
1. Use of models 2. The Particle model and	1. Scientists use models to explain phenomena.	1. recognize that scientists use models to explain phenomena that cannot be

Online ISSN: 3082-5121
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changes of state 3. Planning, following, and recording scientific investigations 4. Solutions, solubility, and concentration	2. The particle model explains the properties of solids, liquids, and gases and the processes involved in changes of state. 3. Diagrams and flowcharts are very useful in demonstrating and explaining the motion and arrangement of particles during changes of state. 4. There are specific processes for planning, conducting, and recording scientific investigations. 5. The properties of solutions such as solubility and reaction to litmus determine their use.	easily seen or detected; 2. describe the Particle Model of Matter as "All matter is made up of tiny particles with each pure substance having its own kind of particles."; 3. describe that particles are constantly in motion, have spaces between them, attract each other, and move faster as the temperature increases (or with the addition of heat); 4. use diagrams and illustrations to describe the arrangement, spacing, and relative motion of the particles in each of the three states (phases) of matter; 5. explain the changes of state in terms of particle arrangement and energy changes: a. solid → liquid → vapor, and b. vapor → liquid → solid; 6. follow appropriate steps of a scientific investigation which includes: a. Aim or problem, b. Materials and equipment, c. Method or procedures, d. Results including data, and

		e. Conclusion. 7. make accurate measurements using standard units for physical quantities and organize the collected data when carrying out a scientific investigation; 8. identify the role of the solute and solvent in a solution; 9. express quantitatively the amount of solute present in a given volume of solvent; 10. demonstrate how different factors affect the solubility of a solute in a given solvent, such as heat; 11. identify solutions, which can be found at home and in school and that react with litmus indicator, as acids, bases, and salts; and 12. demonstrate proper use and handling of science equipment.
Performance Standard *By the end of the Quarter, learners* recognize that scientists use models to describe the particle model of matter. They use diagrams and illustrations to explain the motion and arrangement of particles during changes of state. They demonstrate an understanding of the role of solute and solvent in solutions and the factors that affect solubility. They demonstrate skills to plan and conduct a scientific investigation making accurate measurements and using standard units.		
Suggested Performance Task Design and carry out an investigation to determine the amount of salt in a sample of seawater.		

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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GRADE 7 – QUARTER 3: FORCE, MOTION, AND ENERGY

GRADE 7 THIRD QUARTER - Force, Motion, and Energy		
Content	**Content Standards** **Learners Learn that:**	**Learning Competency** **The learners…**
1. Balanced and unbalanced forces 2. Motion: displacement and velocity 3. Distance-Time graphs 4. Identifying and controlling variables	1. Scientists and engineers analyze forces to predict their effects on movement. 2. Vectors differentiate the concepts of speed and velocity. 3. Graphing motion provides more accurate predictions	1. identify that forces act between objects and can be measured. 2. identify and describe everyday situations that demonstrate: a. balanced forces such as a box resting on an inclined plane, a man

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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5. Heat transfer	about speed and velocity. 4. The particle model explains natural systems and processes. 5. Scientists and engineers conduct innovative research to find solutions to the current global energy crisis by seeking renewable energy solutions.	standing still, or an object moving with constant velocity; b. unbalanced forces, such as freely falling fruit or an accelerating car; 3. draw a free-body diagram to represent the relative magnitude and direction of the forces involving balanced and unbalanced forces; 4. identify that when forces are not balanced, they can cause changes in the object's speed or direction of motion; 5. explain the difference between distance and displacement in everyday situations in relation to a reference point; 6. distinguish between speed and velocity using the concept of vectors; 7. describe uniform velocity and represent it using distance-time graphs; 8. explain the difference between heat and temperature; 9. identify advantageous and disadvantageous examples of conduction, convection, and radiation; 10. explain in terms of the particle model the processes underlying convection and conduction of heat energy;

		and 11. gather information from secondary sources to identify and describe examples of innovative devices that can be used to transform heat energy into electrical energy.
Performance Standard *By the end of the Quarter, learners* employ scientific techniques, concepts, and models to investigate forces and motion and represent their understanding using scientific language, force diagrams, and distance-time graphs. They use their curiosity, knowledge and understanding, and skills to propose solutions to problems related to motion and energy. They explore how modern technologies might be used to overcome current global energy concerns.		
Suggested Performance Task Develop a 2-4 page brochure for parents or leaders in your community to inform them about modern technologies that can be used sustainably to transform heat into electricity in the local community.		

GRADE 7 – QUARTER 4: EARTH AND SPACE SCIENCE		
Content	**Content Standards** **Learners Learn that:**	**Learning Competency** **The learners…**
1. System models 2. Earthquakes 3. The Sun's influence on Earth	1. Rapid movements along normal, reverse or strike-slip faults cause earthquakes. 2. The damage or effects on communities depend on the magnitude of and distance from an earthquake. 3. Sunlight is the Earth's external source of energy. 4. Solar energy influences the atmosphere and	1. classify geological faults according to the angle of the fault plane and direction of slip; 2. use models or illustrations to explain how movements along faults generate earthquakes and identify and explain which types of faults are most likely to occur in the Philippines and explain why; 3. describe how the effects of earthquakes on

	weather patterns. 5. The revolution, rotation, and the tilt of the Earth explain the patterns of day and night and the seasons.	communities depend on their magnitude; 4. use the PHIVOLCS FaultFinder or other reliable information source to identify where the nearest fault system is located from their community and assess the risk of earthquakes to their local community; 5. make models of fault scenarios to illustrate: a. the epicenter of an earthquake from its focus, b. the intensity of an earthquake from its magnitude, and c. how underwater earthquakes may or may not generate tsunamis; 6. refer to the local disaster readiness plans to demonstrate what to do during and after an earthquake; 7. explain how earthquakes result in tsunamis that devastate shoreline communities; 8. describe procedures that the authorities have in place to alert communities of pending tsunamis and what procedures can be implemented should a tsunami impact a

		community; 9. explain how energy from the Sun interacts with the atmosphere; 10. make a physical model or use drawings to demonstrate how the tilt of the Earth relative to its orbit around the Sun affects the intensity of sunlight absorbed by different areas of Earth over a year; 11. explain, using models, how the tilt of the Earth affects the changes in the length of daytime at different times of the year; and 12. explain how solar energy contributes to the occurrence of land and sea breezes, monsoons, and the Intertropical Convergence Zone (ITCZ).

Performance Standard
By the end of the Quarter, learners appreciate the value of using systems to analyze and explain natural phenomena and demonstrate their understanding in explaining the dynamics of faults and earthquakes. They are confident in identifying and assessing the earthquake risk for their local communities using authentic and reliable secondary data. They use the country's disaster awareness and risk reduction management plans to identify and explain to others what to do in the event of an earthquake. Learners explain the cause and effects of secondary impacts that some coastal communities may experience should a tsunami be produced by either local or distant earthquake activity. Learners use reliable scientific information to identify and explain how solar energy influences the atmosphere and weather systems of the Earth and use such information to appreciate and explain the dominant processes that influence the climate of the Philippines.
Suggested Performance Tasks
A. Design, test, and evaluate a model house that can withstand a model earthquake. B. Design, test, and evaluate a model of an innovative house that can adapt to the different weather conditions in the country.

Chapter 2

Research Methodology

This chapter presents the method and procedures adopted by the researcher in conducting the study.

Research Design

The descriptive research design was used in this study. According to Best and Khan (2016). It is a method of gathering information about existing condition or situation for the purpose of analysis descriptive and interpredent. The purpose of the descriptive research is to study primarily "what is" of the condition. This method is appropriate in this study because it determines the extent of implementation of the Matatag Curriculum in Grade 7 taking into consideration the different variables design for Matatag Curriculum for Science 7.

Locale and Population of the Study

This study was conducted in Grade 7 Public Junior High Schools in Malasiqui Division of Pangasinan I with respondents consist 2-A(8) and 2-B(7) of 15 Junior High Schools of the Division and 15 school administrators of Pangasinan 1.

The respondents was projected in Table 1 of the study in the next page.

Table 1

Distribution of Respondents Per School in Grade 7

SCHOOLS 2-A(8)	Number of Teachers	Number of School Administrator

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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1. Olea Elementary School	2	1
2. Bakitiw (Boquid National High School)	2	1
3. Don Pedro High School	3	1
4. Tomling National High School	3	1
5. Warey National High School	2	1
6. San Julian National High School	3	1
7. Aliaga National High School	2	1
8. Maboletec Integrated National High School	2	1
Total	**19**	**8**
SCHOOLS 2-B(7)		
1. Talos Patang National High School	2	1
2. Calimlim Cerezo National High School	3	1
3. Cana National High School	3	1
4. Lareg-Lareg National High School	2	1
5. Nankapean National High School	2	1
6. Tabo National High School	2	1
7. Palapar National High School	3	1
8. Malasiqui National High School	8	2
Overall Total No. of Respondents	**25**	**9**

Data Gathering Instrument

This study used the questionnaire as the data gathering instrument. It was consisted of Part I on the extent of implementation of Revised K-12 Curriculum in Grade 7 Science with variables based on the contents of the frame contents of the said Grade 7 Curriculum in Science Part 2 was on the different factors that negatively affect the implementation of the revised k-12 curriculum Grade 7 Science.

The questionnaire was adopted from Grade 7 Curriculum in Science as Revised in the K-12 Curriculum.

Data Gathering Procedures

The researcher sought permission from the Schools Division Superintendent, Pangasinan I to administer the questionnaire. When permission will be granted the researcher also asked permission from the 27 school administrators of the different public junior high school in

Malasiqui I, Division of Pangasinan I. The set of the questionnaire was personally floated by the researcher so that 100 percent of the questionnaire was obtained. After the retrieval of the instrument the data were tallied and organized into tables for analysis and interpretation.

Statistical Treatment of the Data

Problem 1. Implementation of the learning competencies of Revised K-12 Curriculum in Grade 7 Science.

Likert	Scale Limit	Descriptive Equivalent
4	(3.41 – 4.20)	Very High (VH)
3	(2.61 – 3.40)	High (H)
2	(1.81 – 2.60)	Moderate (M)
1	(1.00 – 1.66)	Low (L)

Problem number 2 on determining the differences between the perception of the teacher and their school administrator in the implementation of K-12 Curriculum. t –test will be used.

Formula:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{SD\overline{x}}$$

where:

$\overline{X}_1$ = First Mean

$\overline{X}_2$ = Second Mean

$SD\bar{x}$ = Standard error of difference between the two means

Problem number 3 on determining the strengths and weaknesses of the teachers in the implementation of Revised Curriculum. The mean 2.61 and above will be strengths and 2.60 below their weaknesses.

Problem number 4 will be on the factors that affect the implementation of K-12 Curriculum in Science Grade 7 by the Matatag Curriculum in Grade 7 Science.

Likert	Scale Limit	Descriptive Equivalent
3	(2.34 – 3.00)	Very High (VH)
2	(1.67 – 2.33)	High (H)
3	(1.00 – 1.66)	Low (L)

Chapter 3

Interpretation of Data

This chapter dealt on the analysis and interpretation of data gathered with the use of the questionnaire. It dealt on the competencies of the learners in the different areas of Grade 7 Science quarter 1.

Grade 7 Quarter 1 Science of Materials

Indications: Reorganized that Science teacher School Administrator overall use models to explain implementation AWM that cant be detected / sees 2.58 moderate (M).

Table 2 revealed the indicators on the competencies as high, although of we consider the top five competencies they are as follows: make accurate measurements using standard measurement for physical quantities and organize the collected data where carrying out a scientific investigation 2.89, identify the role of the solute and the solvent in a solution 2.86; demonstrate the high different factors effect the solubility of a solution in a given solvent which can be found at home and in school and that react with indicators in aside, bases, and salts 2.80. The findings implied that the respondents manifest certain promising abilities to death with the use of models, particle model, plessing, following and recording scientific investigation, solutions solubility and concentration.

Table 2

Science of Materials

	Teachers		School Administrators		Overall	
	AWM	DE	AWM	DE	AWM	DE
1. Recognize that scientists use models to explain phenomena that cannot be easily seen or detected;	2.65	H	2.65	H	2.65	H

2. Describe the Particle Model of Matter as "All matter is made up of tiny particles with each pure substance having its own kind of particles."	2.70	H	2.71	H	2.71	H
3. Describe that particles are constantly in motion, have spaces between them, attract each other, and move faster as the temperature increases (or with the addition of heat)	2.76	H	2.77	H	2.77	H
4. Use diagrams and illustrations to describe the arrangement, spacing, and relative motion of the particles in each of the three states (phases) of matter;	2.68	H	2.70	H	2.69	H
5. Explain the changes of state in terms of particle arrangement and energy changes:	2.70	H	2.71	H	2.71	H
a. solid → liquid → vapor, and						
b. vapor → liquid → solid;						
6. Follow appropriate steps of a scientific investigation which includes:	2.90	H	2.88	H	2.89	H
a. Aim or problem,						
b. Materials and equipment,						
c. Method or procedures,						
d. Results including data, and						
e. Conclusion.						
7. Make accurate measurements using standard units for physical quantities and organize the collected data when carrying out a scientific investigation;	2.85	H	2.86	H	2.86	H
8. Identify the role of the solute and solvent in a solution;	2.70	H	2.71	H	2.71	H

9. Express quantitatively the amount of solute present in a given volume of solvent;	2.80	H	2.80	H	2.80	H
10. Demonstrate how different factors affect the solubility of a solute in a given solvent, such as heat;	2.79	H	2.80	H	2.80	H
11. Identify solutions, which can be found at home and in school and that react with litmus indicator, as acids, bases, and salts; and	2.80	H	2.79	H	2.80	H
12. Demonstrate proper use and handling of science equipment.					2.80	H
Total AWM	**2.76**	**H**	**2.80**	**H**	**2.80**	

The table showed the bottom three indicators such as explain the changes of state in terms of particles arrangement and energy changes 2.69, describe that the particles are constantly in motion have spaces between them, attract each other and move faster as the temperature increases 2.71, follow appropriate steps of a scientific of scientific investigation which includes problem, materials and equipment, methods or procedure, results including data, and conclusions 2.71, and express quantity 2.71. The findings imply that the learners and slow in stator the particles arrangement and energy changes and express quantitatively the amount of solute present in a given volume of solvent 2.71. The findings implied that the learners are weak a making scientific investigation, using equipment method and procedure. The whole revealed that the learners and not highly equipped with the scientific materials needed to investigation successfully.

Table 3 Learning Competencies Quarter 2 Life Science

The table revealed the seven competencies in life science quarter 2 were moderately learned by the Grade 7 learners. They were as follows: identify the parts and furniture's and demonstrate proper handling and storing of a compound microscope 2.6; use proper technique in observing and identifying the parts of a cell with a microscope such as the cell membrane, nucleus cytoplasm, mitochondria and chloroplasma 2.59; recognize some organism connects of a single cell like in bacteria and some consists of many cells like in a human 1.95, differentiate plant and crucial cells based from their organelles 2.60; reorganize the cell posture through two types of cell division mitosis and meiosis, and describe mitosis as cell division for growth and repair 2.63, explain the gastric information is passed in to offspring from both parts by the process of meiosis and fertilization 2.56. The findings implied that the learners were generally weak in life science particularly on the plant and animal cells and level of biological organization

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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and trophic levels and transfer of energy.

Table 3

Learning Competencies Quarter 2 Life Science

	Teachers		School Administrators		Overall	
	AWM	DE	AWM	DE	AWM	DE
1. Identify the parts and functions, and demonstrate proper handling and storing of a compound microscope;	2.60	M	2.60	M	2.60	M
2. Use proper techniques in observing and identifying the parts of a cell with a microscope such as the cell membrane, nucleus, cytoplasm, mitochondria, and chloroplasts;	2.58	M	2.59	M	2.59	M
3. Recognize that some organisms consist of a single cell (unicellular) like in bacteria and some consist of many cells (multicellular) like in a human;	1.90	M	199	M	1.95	M
4. Differentiate plant and animal cells based on their organelles;	2.60	M	2.60	M	2.60	M
5. Recognize that cells reproduce through two types of cell division, mitosis and meiosis, and describe mitosis as cell division for growth and repair;	2.65	H	2.60	M	2.63	M
6. Explain that genetic information is passed on to offspring from both parents by the process of meiosis and fertilization;	2.55	M	2.56	M	2.56	M

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Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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7. Differentiate sexual from asexual reproduction in terms of: a) number of parents involved, and b) similarities of offspring to parents;	2.60	M	2.60	M	2.60	M
8. Use a labelled diagram to describe the connections between the levels of biological organization to one another from cells to the biosphere;	2.61	H	2.62	H	2.62	H
9. Describe the trophic levels of an organism as levels of energy in a food pyramid; and	2.60	M	2.61	H	2.61	H
10. Use examples of food pyramids to describe the transfer of energy between organisms from one trophic level to another.	2.62	H	2.62	H	2.62	H
Total Average Weighted Mean	**2.53**	**M**	**2.54**	**M**	**2.54**	**M**

On the otherside of the coin they were competent in using labelled diagram to describe the connections between the level of biological organization to use another from cells to the bicoplane, describe the trophic levels of an organization of organization as of energy in a found pyramid, and use examples of food pyramids to describe the transfer of energy between the organism to form use trophic level to another.

As a whole, it could be recorded that the learners were moderate in life scientific proven by the overall total of 2.54. It meant and implied that the learners facted to acquire and develop highly and considerably expected that their Grade 7 learners in science were still weak in the second quarter which dealt ion life and science.

Grade 7 Quarter 3 Force, Motion and Energy

Data in the table showed that the third quarter manifested as processing improvement in the acquisition and development of the competence of the learners in force, motion and energy.

There were 11 competence of Science the learners had to work. Out of the eleven competencies there were six competencies which were describe moderate such as: identify that forces arts between objects and can be measured 1.79, identify and describe everyday situations that demonstrate balance of forces as a box resting on an inclined plane 2.60; draw a free-body diagram to represents the relative magnitude and direction of the forces, involving balance and unbalanced forces 2.65; explain the difference between distance and displacement in everyday situations in relation to a reference 2.60; and officially describe uniform velocity and represent it using distance – tissue graphs 2.53. The findings meant and implied that the learners manifested certain positive direction in the acquisition of the competence in force, motion, and energy. They need to work hard to accomplish the needed strengths to benefit from the scientific evidence of

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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motion and energy.

Table 4

Force, Motion and Energy

	Teachers		School Administrators		Overall	
	AWM	DE	AWM	DE	AWM	DE
1. Identify that forces act between objects and can be measured.	1.70	M	1.79	M	1.75	M
2. Identify and describe everyday situations that demonstrate:						
a. balanced forces such as a box resting on an inclined plane, a man standing still, or an object moving with constant velocity;	2.60	M	2.60	M	2.60	M
b. unbalanced forces, such as freely falling fruit or an accelerating car;	2.63	M	2.64	M	2.64	M
3. Draw a free-body diagram to represent the relative magnitude and direction of the forces involving balanced and unbalanced forces;	2.64	M	2.65	M	2.65	M
4. Identify that when forces are not balanced, they can cause changes in the object's speed or direction of motion;	2.70	H	2.80	H	2.75	H
5. Explain the difference between distance and displacement in everyday situations in relation to a reference point;	2.60	M	2.60	M	2.60	M
6. Distinguish between speed and velocity using the concept of vectors;	2.70	H	2.70	H	2.70	H
7. Describe uniform velocity and represent it using distance-time graphs;	2.50	M	2.55	M	2.53	M

8. Explain the difference between heat and temperature;	2.85	H	2.85	H	2.85	H
9. Identify advantageous and disadvantageous examples of conduction, convection, and radiation;	2.90	H	2.90	H	2.90	H
10. Explain in terms of the particle model the processes underlying convection and conduction of heat energy; and	2.92	H	2.92	H	2.92	H
11. Gather information from secondary sources to identify and describe examples of innovative devices that can be used to transform heat energy into electrical energy.	2.89	H	2.90	H	2.90	H
Total Average Weighted Mean	**2.86**	**M**	**2.86**	**H**	**2.86**	**H**

As a whole, it could be gleaned that the learners use their curiosity knowledge, and understand and skills to propose solutions to problems related to motion and energy. They explore how modern technologies might be used to overview global energy concerns.

Grade 7 Quarter 4 Earth and Space Science

Table 5

Earth and Space Science

	Teachers		**School Administrators**		**Overall**	
	AWM	**DE**	**AWM**	**DE**	**AWM**	**DE**
1. Classify geological faults according to the angle of the fault plane and direction of slip;	2.5	M	2.6	M	2.6	M
2. Use models or illustrations to explain how movements along faults generate earthquakes and identify and explain which types of faults are most likely to occur in the Philippines and explain why;	2.6	M	2.6	M	2.6	M
3. Describe how the effects of earthquakes on communities depend on their	2.8	H	2.9	H	2.9	H

magnitude;						
4. Use the PHIVOLCS FaultFinder or other reliable information source to identify where the nearest fault system is located from their community and assess the risk of earthquakes to their local community;	2.7	H	2.8	H	2.8	H
5. Make models of fault scenarios to illustrate:	2.8	H	2.8	H	2.8	H
a. the epicenter of an earthquake from its focus,						
b. the intensity of an earthquake from its magnitude, and						
c. how underwater earthquakes may or may not generate tsunamis;						
6. Refer to the local disaster readiness plans to demonstrate what to do during and after an earthquake;	2.9	H	2.9	H	2.9	H
7. Explain how earthquakes result in tsunamis that devastate shoreline communities;	2.9	H	2.9	H	2.9	H
8. Describe procedures that the authorities have in place to alert communities of pending tsunamis and what procedures can be implemented should a tsunami impact a community;	3.0	H	3.1	H	3.1	H
9. Explain how energy from the Sun interacts with the atmosphere;	3.0	H	3.1	H	3.1	H
10. Make a physical model or use drawings to demonstrate how the tilt of the Earth relative to its orbit around the Sun affects the intensity of sunlight absorbed by different areas of Earth over a year;	3.1	H	3.1	H	3.1	H
11. Explain, using models, how the tilt of the Earth affects the changes in the length of daytime at different times of	3.0	H	3.0	H	3.0	H

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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the year; and						
12. Explain how solar energy contributes to the occurrence of land and sea breezes, monsoons, and the Intertropical Convergence Zone (ITCZ).	3.1	H	3.0	H	3.1	H
Total Average Weighted Mean	**2.90**	**H**	**2.91**	**H**	**2.91**	**H**

It was revealed in the table that two indication were rated moderate such as: classify that geological faults according to the angle of the fault plane and direction of slip 2.6 and use models to illustrate and to explain how the movements along faults generate earth quake identify and classify; identify and explain which types of faults are more highly likely to occur in the Philippines 2.6.

The findings meant and implied that the learners failed to maximize their knowledge on how earthquake generate types of faults are most likely to occur why.

Considering the other competencies, it could be deduced that they were highly learned such as described procedures that the authorities have implace to alert communities of padding tsunami and what procedures can be implemented 3.1, explain how energy from the sun interout with the atmosphere, 3.1, make physical model or use drawing to demonstrate how the belt of the each relative to its orbit around the sun 3.1. The findings implied that the learners had mastered most of the competencies in earth and space science proven by the overall data average mean of 2.9 described as high.

Table 5 showed the learning competencies of the learners in Grade 7 Science which was on earth and space science. There were topics along system models, earthquake and sun's influence on earth. The table manifested two (2) competencies which were describe moderate such as classify geographical faults according to the angle of the fault plane and direction of ship 2.60 and use model or illustration to explain how movements along faults generate earthquake and identify and explain which types of faults are most likely to occur in the Philippines and explain why 2.60. The findings implied that the learners had experience on the condition of earth and space science that made them aware and find it more interesting to explains the condition of the earth and space science.

The remaining competencies were described high as they were familiar to them such as describe how the effects of earthquake on communities depend on their magnitude 2.9. makes model of faults scenarier to illustrate epiremeter of the earthquake 2.8 refer to the local disaster or redisen plan to demonstrate what to do during and after the earthquake 2.9.

Summary of the Competencies in Grade 7 Science

Table 6

Summary of the Competencies in Grade 7 Science

	Competences	
	AWM	DE
1. Science of Materials	2.70	H
2. Life Science	2.54	M
3. Force, Motion and Energy	2.86	H
4. Earth and Space Science	2.91	H
Total Average Mean	**2.78**	**H**

Table 6 revealed that one of the dimensions was rated and described as moderate with a weighted mean of 2.54. This meant and it implied that they had not mastered yet the competencies in life science. However, the results manifested a processing choice of improvement in the area of life science. Going further that other dimensions showed the positive direction of having better the other areas like earth and spaces science rated high 2.91. force and motion and energy 2.86 high, and science of materials 2.8 describe as high. As a whole, it could be deduced that the Grade 7 learners could achieve more to higher level the competencies in Grade 7 Science. The implied that they in her strong foundation in science as they go forward to higher level.

Proposed Action Plan to Enhance / Improve the Learning Competencies of Learners in Grade 7 Science

Introduction:

The totality of the goal of Grade 7 Science Curriculum is the achievement of the scientific environment and technology of learners. To achieve the outcomes of the curriculum the learners will be prepared to participate in the local, national and global context and make meaningful contribution in a dynamic, cultural diversity in expanding world. By successfully completing the scissors curriculum learners well demonstrated capabilities as embodied in the Basic Education Development Plan (BEDP).

The plan is composed of the following parts.

a. Areas of Concern
b. Goals / Objectives
c. Activities / Strategies
d. Time Frame
e. People Involved
f. Budget Source
g. Success Indicator

B. Action Plan Proper

Areas of Concern	Goals / Objectives	Activities / Strategies	Time Frame	People Involved	Budget Source	Success Indicator
1. Quarter I Use diagram and illustration to describe the arrangement spacing and relative motion of all the particles.	Use diagram and illustration to describe arrangement spacing and relative motion of the particles.	Group dynamics, lectures, illustration of the diagram reporting.	First quarter / class hours	Teachers, learners invited guest	P10,000 MOE	90 percent of the learners shall have learned to use diagram and illustration to describe the arrangement.
2. Recognize that some organization consists of single cell and multi	Recognize that some organization consist of single cell and multicellula	Reporting, illustration, experiment	Class hour as scheduled	Teachers, learners experienced	P10,000 MOE	90 percent of the learners skill have recognized organization consists of a

cellular like life in human.	r like the human.					single and multicellular like life in human.
3. Identify the laws forces act between objective and can be measured	Identify the law forces between objectives and can be measured	Group dynamics, lectures, experiment	Classroo m hours Quarter I	Teachers, learners invited lecturers	P5,000	90 percent of the learners shall have identified laws and forces.
4. Classify geological faults according to the angle and direction of slop.	Classify geological faults according to angle and direction of slop.	Lecture, reporting, experiment	Class hours as scheduled	Teachers, learners	P5,000 donatio n	90 percent of the learners shall have classified geological faults according to angle and direction slop.

5. Use models of illustratio n to explore have how movemen ts along faults generate earthquak e and identify which types of multi	Use models of illustration to explain how movements along faults generate earthquake.	Group work, lectures, experiment	Class hours Quarter I	Teachers, learners invited guests	P5,000 donation	90 percent of the learners shall have used model of illustration to experiment how movement generate earth quake.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
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Chapter 4

Summary of Findings, Conclusions and Recommendation

This chapter deals on the findings, conclusions and recommendation of the study as the results of the discussion of the data. It is composed of the competencies of by chapter as of quarter I Science of materials, quarter 2 Life Science, chapter 3 force, motion and energy chapter 4 earth and space science.

Findings

The following were the salient findings of the study.

1. The learning competencies of the learners was high in the first quarter science of materials 2.80, second quarter, life science moderate 2.54; third quarter, motion, and energy high 2.86; quarter 4 earth and space science high 2.91.
2. There was no significance between the perceptions of the grade 7 science teacher and their administration on the extent of implementation of the Grade 7 Science Curriculum in the different dimension from the four quarters.
3. There were more weaknesses that strengths of the levels in the competencies of Grade 7 teachers.
4. The proposed plan of action was formulated to enhance and improve their learning competencies of the learners in Grade 7 Science.

Conclusions

The findings were the conclusion formulated from the findings.

1. The learners manifested positive achievement of learning competencies in Grade 7 Science except in quarter 2 life and science that can be improve through the use of strategies in teaching science, and modernization of the use of different teaching materials.
2. The perception of the teachers and school administration on the learning competencies were the same.
3. The learning competencies was overshadowed by the weaknesses that strengths.
4. The proposed action plan can be proposed to improve the learning competencies in teaching Grade 7 Science.

Recommendations

The following were strongly recommended by the researcher to achieve the good results of teaching Grade 7 Science.

1. Teachers should adornete strong collaboration of sharing their skills, strategies, materials and other related matters to enhance their performance in testing and learning competencies in

Grade 7 Science.

2. There should be creative sharing of expertise in teaching science to achieve the goals and objectives of teaching Grade 7 Science.

3. Teachers should maintain the positive outlook in teaching science and aspiration to have continued and achievement of the skills in science and engage in experimentation for discovery research.

4. The proposed action plan should be endorsed to the highest schools for use by the science teachers and learners.

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