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Utilization of "Science Magic Dice" (Self-Developed Sim) In Improving Science Vocabulary Skills and Academic Performance of Grade VI Pupils

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ABSTRACT

This study was conducted to assess the effectiveness of utilizing "Science Magic Dice" (Self-Developed Strategic Intervention Material) in improving Science vocabulary skills and academic performance of Grade VI pupils in Kalubkob Elementary School in the school year 2019-2020.

The researcher utilized the quasi-experimental design. Two sections of Grade VI were selected as respondents with the total of 78 or 100 percent of pupil. The pupils were subjected to pretest and posttestfocus on the first quarter learning competencies.

This research project was conducted over a five-month period, from June to October 2019. The grade VI teacher was the one who incorporated the strategy to each lesson which was consisted of an introduction, vocabulary building, experiment, and a conclusion to the lesson that would last for 50 minutes. The researcher monitored the implementation of the project.

The data gathered were analysed statistically to answer the questions proposed in the research work. Frequency count, percentages, mean, standard deviation and paired sample t-test were used to statistically analyse the data using the SPSS Tool.

The following findingscame up from the study: There was a significant difference on the level of vocabulary skills and academic performance of the pupils in the pretest and posttest results. After the implementation of the intervention material, higher mean was observed from the pupils.

The strategic intervention material was effective in improving the vocabulary skills based on the mean gain scores in the posttests.

Based on the outcomes and implications of the study, the following are recommended, Science teachers can use the strategic intervention materials developed by the researcher to improve the vocabulary skills of the pupils and their academic performance in science. Seminars and in-service training should be conducted regarding development and implementation of the strategic intervention materials in the classroom; Science teachers should develop more strategic intervention materials for the remaining lessons which were not included in researcher's SIMS; Strategic intervention materials for other subjects should be made to address the vocabulary skills development of the pupils; A similar study may be conducted covering a bigger number of respondents in another venue.

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The Researcher

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CHAPTER 1
THE PROBLEM AND ITS BACKGROUND

Introduction

Science is interesting but difficult subject. To be able for the pupils to grasp every concept that they should learn, teachers must provide appropriate strategies suited for their learning preferences.According to Ambat (2010), some factors which contribute in the poor academic performance in science is the underdevelopment of the vocabulary skills of the pupils which is very relevant in this subject and communication skill since Science is taught in English which lead to poor higher order thinking skills.

Vocabulary instruction is crucial when you want to improve students' comprehension and science literacy. Vocabulary instruction shoulduse different strategies, and must continue to elicit prior knowledge to be student centered.

During classroom observation, the researcher noticed that most pupils are hesitant to answer the teacher's questions especially when it comes to unfamiliar science terminologies that the teacher is using. Furthermore, on the result of the Learning Outcome Assessment Grade VI pupils has the lowest mean score in Science.

According to Rupley and Slough (2005), every content-area, teacher must teach vocabulary to build the gap in vocabulary instruction and comprehension. As Rubley& Slough, p. 100 stated,students have to understand the science language and the teacher instruction in which it is presented. Science is loaded with terminologyso to increase student vocabulary, Young (2005) recommend that teachers should contextualize word meanings, establish a relationship, and provide multiple exposuresand usage of words (p. 12).

Because of these factors, the researcher wanted to get a better idea if vocabulary development has something to do with the low scores of the pupils. The researcher also wanted to see if by developing the pupils' vocabulary background, their content knowledge would increase.These reasons that made the researchers embarked on developing strategic intervention materials in Science that will enhance pupils' vocabulary skills.

CHAPTER 2

REVIEW OF RELATED LITERATURE

In reading comprehension vocabulary knowledge is necessary on how can children understand the science text or science language without knowing what the word means. Nagy (1998) mentions that the obviousness of the need and strong relationship between vocabulary and comprehension invite a simplistic response if students were taught more words to understand the text better. (p. 9).

As stated by the National Science Education Standards, 1996, the vision of science education is to implement scientific literacy in the classroom for the 21st century that allows students to use scientific skills in making a personal decision and discussing the scientific issue in real life situations. As Young (2005) reported, when students understand the language of their science subjects, they are well on their way to content literacy mastery (i.e., being able to read, write, speak, listen, and effectively communicate content knowledge with a high degree of competency and expertise) (p. 15). He added however, that students must understand the meaning of vocabulary words, process this information, and use new concepts to achieve literacy mastery.

According to Cromley, Snyder-Hogan &Luciw-Dubas(2010) reading comprehension is a link to scholars' academic achievement including science achievement and Science achievement is based on students' performance in the classroom, tests in the classroom, and state standardized tests. To measure vocabulary instruction for reading comprehension they used two types of comprehension measurements: (a) global comprehension measures and (b) wordspecific measures (p. 79). They addedthat a teaching method for vocabulary was measured by global vocabulary measures, definitional word-specific measures, and contextual words specific measures.

One traditional method that teachers use in the classroom for vocabulary instruction is giving students vocabulary words and asking the student to look up the meaning and then write this meaning down. Unfortunately,according to Blachowitz, Fisher, and Ogle (2006), this strategy does not meet the requirements for effective vocabulary teaching. Teachers have failed in improving reading comprehension by not teaching in depth vocabulary instruction. Teachers have to get the student to use prior knowledge, to use context information, and to decode new words.

From the point of view of Allen, 1999; Rubley&Slough, 2010; Taylor, Mraz, Nichols, Rickelman& Wood, 2009, not only do teachers have to build up background knowledge for the children, but they must then connect the vocabulary word to that knowledge as stated by Glowacki, Lanucha, &Pietrus, 2001, pp. 34 35) that word study should be integrated with prior knowledge and with learning in the content areas in order to assist pupils in vocabulary development. Teachers should teach children how to associate words they already know with new words. (Taylor et al., 2009).

According to Blachowicz&Fishern(2002),if students were taught the correct vocabulary strategies they can increase their knowledge and interest in science language. This may help close the gap between new science content and background knowledge students bring into the classroom. They added that vocabulary instruction should not just be expected in English class, but in every content area. When students read a science textbook they are expected to know what the words mean but without background knowledge of a certain topic, students' understanding of vocabulary is hindered. By using certain strategies, students' comprehension of the text, vocabulary, as well as key concepts will increase dramatically. Some ways to increase students' vocabulary include contextualizing word meanings, establishing relationships between terms and providing multiple exposures to and usage of words as sated by Gunning(1998).

According to Ambruster& Osborn (2001), the vocabulary words should be used in real life science-area contexts in contextualizing word meanings. A teacher needs to help students realize how new vocabulary words relate to old vocabulary words in order to establish relationships. Multiple exposures are provided by using vocabulary in different ways that enables the use of things such as context clues, analogies, or word parts. It is important to develop students' vocabulary understanding of four core types of vocabulary: listening vocabulary, speaking vocabulary, reading vocabulary, and writing vocabulary. These are all needed in students' science lessons at different times. Students will need listening vocabulary when they are required to understand the words they hear, speaking vocabulary when they speak, readingvocabulary in order to understand what they read, and writing vocabulary when students are writing about science topics.

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CHAPTER 3
INNOVATION, INTERVENTION AND STRATEGY

The "Science Magic Dice" is a self-developed strategic intervention material developed by the researcher with the following goals in mind:
1. Familiarize the pupils with the difficult words/terminologies that can be encountered in the topic.
2. Help the pupils widen their vocabulary to comprehend easily and enjoy the topics being presented.
3. Develop the critical thinking and highest order thinking skills of the pupils as well as their communication skill.
4. Learn and understand the difficult words through the use of modified board games and enjoy at the same time.
5. Inculcate the value of cooperation, teamwork and sportsmanship.

Not just to give the meaning but this will be attain through the use of games in which the pupils are familiar with. These games will be incorporated in learning to be able for the pupils to learn and enjoy at the same time. This self-developed strategic intervention material is composed of modified board games include Science Word Game, Science Word Search, Science Tic Tac Toe and Science Bingo.

This intervention material was used during Science class for grade VI pupils during first quarter period. It was used as one of the instructional materials and incorporated in every science lesson daily. The difficult words or Science terminologies were written in the cubes which served as the dice thus term "Science Magic Dice". The difficult words came from the list of topic with Least Mastered Skill in Learning Outcome Assessment in Science VI which include appearance and uses of uniform and non-uniform mixtures; techniques in separating mixtures such as decantation, evaporation, filtering, sieving and using magnet; and benefits of separating mixtures from products in community.

The grade VI teacher was the one to incorporate the strategy in each lesson. Each science lesson involved an introduction, vocabulary building, experiment, and a conclusion to the lesson. Each lesson would typically last for 50 minutes. The researcher monitored the implementation of the project.

As a result of the student responses, the strategies were implemented and assessed throughout the quarter.

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CHAPTER 4
ACTION RESEARCH QUESTIONS

This study assessed the effectiveness of utilizing "science magic dice" (self-developed SIM) to enhance science vocabulary skills of grade six pupils, thus attained improvement in their academic performance.

Specifically, it answeredthe following questions:

1. What is the level of vocabulary skills of the pupils before the implementation of Science Magic Dice(self-developed SIM)?
2. What is the level of vocabulary skills of the pupils after the implementation of Science Magic Dice(self-developed SIM)?
3. What is the level of academic performance of the pupils based on the pre-testresults?
4. What is the level of academic performance of the pupils based on the post test results?
5. Is there a significant difference that exists between the following:

5.1 level of vocabulary skills before and after the implementation of Science Magic Dice
5.2 pretest and post-test results

CHAPTER 5
ACTION RESEARCH METHODS

a. Participants and/or other Sources of Data and Information

This study focused on the utilization of "science magic dice" (self-developed SIM) in improving vocabulary skills and academic performance of Grade VI pupils in Kalubkob Elementary School, DepEd Municipality of Silang , Division of Cavite, school year 2019-2020.

Two sections of Grade VI were selected as respondents: with the total of 78 or 100 percent of pupil(47 males and 31 females) currently enrolled in Kalubkob Elementary School during the School Year 2019-2020.

This study focused on the first quarter learning competencies such as: describe the appearance and uses of uniform and non-uniform mixtures; enumerate techniques in separating mixtures such as decantation, evaporation, filtering, sieving and using magnet; andtell the benefits of separating mixtures from products in community.

Before and after the treatment, two questionnaires were given to the pupils. First set of questionnaires given is one assessment that uses specific vocabulary words, which is sensitive to incremental vocabulary growth and uses self-reporting, the vocabulary knowledge scale (VKS) (Stahl & Bravo, 2010). This instrument is a standard scale type of questionnaire but the contents were chosen by the researcher.This was composed of fifteen words taken from first quarter topics(Appendix C) andwas validated by Master Teacher before the administration. The second questionnaire is the division-wide quarter test in science for first quarter period composed of 50 items.These questionnaireswere given twice, pre-test and post-test.

b. Data Gathering Methods

A letter of request to conduct the study was sent to Dr. Mary Ann Batino, District Supervisor of Silang where the school is located. Upon approval, the researcher made an arrangement to the teacher and the grade VI classes prior of giving the pretest to the pupil respondents. This was the pilot pretest to the respondents before the experiments. This was done personally by the researcher. The respondents were oriented by the researcher in answering the pretest questionnaire. After the orientation, they answered it. The respondents were given enough time to answer the questionnaire before collecting it. After answering, the questionnaires werecollected from each respondent and were scored, tabulated, and analysed to determine the response of the respondent.

This action research project was conducted over a five month period, from June 2019through October 2019. The grade VI teacher was the one to incorporate the strategy in each lesson. Each day wasconsisted of a science lesson involving an introduction, vocabulary building, experiment, and a conclusion to the lesson. Each lesson would typically last for 50 minutes. The researcher monitored the implementation of the project. As a result of the student responses, the strategies were implemented and assessed throughout the quarter.

c. Ethical issues

The researcher is responsible in ensuring the welfare of the respondents. Since the respondents are minor, the researcher sought the approval of their parents through a letter of consent that they are allowing their child to participate in the research project. The pupils werefully-informed that they will be asked to answer the questionnaire. Before the conduct of study, researcher's expectations from them were discussed as well as their expectations from the researcher.

On the secrecy and confidentiality of the information, the researcher ensured that there were no identifying information were revealed on the identity of each respondent.

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CHAPTER 6
DISCUSSION OF RESULTS AND REFLECTION

1. What is the level of vocabulary skills of the pupils before the implementation of Science Magic Dice (self-developed SIM)?

Table 2: Results of the Pre-Test on the level of vocabulary skills of the pupils

	N	Weighted Mean	Learning Level
Pretest	78	2.40	Moving Towards Mastery

Table 2 shows the result of the pretest conducted to 78 respondents to know the level of their vocabulary skills. The weighted mean of 2.40 shows that the level of vocabulary skills of the pupils was moving towards mastery.

2. What is the level of vocabulary skills of the pupils after the implementation of Science Magic Dice (self-developed SIM)?

Table 3: Results of the Post-Test on the level of vocabulary skills of the pupils

	N	Weighted Mean	Learning Level
Post test	78	4.16	Mastered

Table 3 shows the result of the post test conducted to 78 respondents to know the level of their vocabulary skills after the implementation of Science Magic Dice (self-developed SIM). The weighted mean of 4.16 shows that the level of vocabulary skills of the pupils improved as evident of mastered learning level.

3. What is the level of academic performance of the pupils based on the pre-test results?

Table 4: Results of the Preteston the level of academic performance of the pupils

	N	MEAN	SD	MPS	Learning Level
Pretest	78	38.21	5.77	76.42%	Closely Approximating Mastery

Table 4 shows the result of the pretest conducted to 78 respondents to know the level of their academic performance in science. There were 50-item test given to the pupils. The data shows that there was a mean of 38.21, standard deviation of 5.77 and an MPS of 76.42% which is closely approximating mastery.

4. What is the level of academic performance of the pupils based on the post test results?

Table 5: Results of the Posttestonthe level of academic performance of the pupils

	N	MEAN	SD	MPS	Learning Level
Post test	78	43.12	2.78	86.24%	Mastered

Table 5 shows the result of the post test conducted to 78 respondents to know the level of their academic performance in science. There were 50-item test given to the pupils. The data shows that there was a mean of 43.12, standard deviation of 2.78 and an MPS of 86.24% which is under mastered learning level.

5. Is there a significant difference that exists between the following:

a. level of vocabulary skills before and after the implementation of science magic dice

Table 6: Results of the significant difference of Pre-Test and Post-Test on the level of vocabulary skills of the pupils

N	PRE-TEST	POST-TEST	Difference	t -value	Level of Significance
78	2.40	4.16	1.76	23.36	Significant

The t-value is 23.36198. The p-value is < .00001. The result is significant at p <.05.

Table 6 showed evident results after Science Magic Dice (self-developed SIM)was implemented in teaching Science. In terms of vocabulary skills, Post test results got a remarkable improvement. (4.16)Post tests indicated that pupils who were taught with strategic intervention material had significantly better improvement of vocabulary skills. They gained mastery level of the lesson presented.

b. pretest and post-test results

Table 7: Results of the significant difference of Pre-Test and Post-Test on the level of academic performance of the pupils

N	PRE-TEST	POST-TEST	Difference	t -value	Level of Significance
78	76.42	86.24	9.82	8.45	Significant

The t-value is 8.45265. The p-value is < .00001. The result is significant at p < .05.

Table 7 showed evident results after Science Magic Dice (self-developed SIM)was implemented in teaching Science. In terms of academic performance, Post test results got a remarkable improvement. (86.24%).Post tests indicated that pupilswho were taught with strategic intervention material had significantly better improvement of vocabulary skills thus improved their academic performance. They gained mastery level of the lesson presented.

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The strategic intervention material was effective in improving the vocabulary skills and academic performance of the pupils based on the mean gain scores in the post tests. The researcher's findings agreed with the findings of Hogan (2000) and Woodward (2004), who found out that intervention materials contributed to better learning of the concepts among students.

Based on the outcomes and implications of the study, the following are recommended, Science teachers can use the strategic intervention material made by the researcher to improve the vocabulary skills of the pupils and their academic performance in science. Seminars and in-service training should be conducted regarding development and implementation of the strategic intervention materials in the classroom; Science teachers should develop more strategic intervention materials for the remaining lessons which were not included in researcher's SIMS; Strategic intervention materials for other subjects should be made to address the vocabulary skills development of the pupils; A similar study may be conducted covering a bigger number of respondents in another venue.

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CHAPTER 7
ACTION PLAN

COMPONENTS	KEY IMPROVEMENTS	STRATEGIES	RESOURCES REQUIRED	PERSONS INVOLVE	TIME FRAME	EXPECTED OUTPUT
1. Pupil Development	Increase MPS in Science by 10%	Identify and target pupils with minimum growth (slow learners)	Performance Target Monitoring Chart, practice tests, Least Mastered Skills,	MTs, Science Coordinator, Science Teachers	June-March 2020	Targets set in MPS are met.
		Set targets for pupil achievement (by the end of each grading period)				Reported pupil's achievement
		Conduct on-the spot tests				Pupils' test performances were measured.
		Develop personalized intervention programs for slow learners	Pupil's profile, strategic intervention materials, monitoring and evaluation report			Pupils-at-risk and below minimum performance decreased.
	Engage pupils in meaningful activities that stimulate learning.	Allow pupils to do hands-on activities to learn more	Activity sheets, laboratory materials, others	MTs, Science Coordinator, Science Teachers	Year-Round	Pupils participation in science programs increased.
						An increased in pupil's learning outcomes is evident.

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2.Instructional Development	Upgrade the competencies of teachers in terms of instructional skills	Conduct School Learning Action Cell (SLAC) for proper utilization of the strategy.	References, slide decks, photocopies of materials	Principal and Teachers	November2019	Teachers had improved their competencies in terms of instructional skills
3.Curriculum Development	Ensure the implementation of Strategic Intervention Material in all grade levels in Science curriculum.	Modify Localized & Contextualized Teacher's Guide and Learner's Manual by incorporating Strategic Intervention Material in teaching	DLL, activity sheets, SIM	Principal and Teachers	November-March 2020	Teachers had implemented the utilization of Strategic Intervention Material in all grade levels in Science curriculum.

REFERENCES

[1]. Ambat, V. D. 2010. Intelligences and Academic Performance of Grade V pupils in Silang Central
[2]. School: An assessment for the Enhancement of the Curriculum.Unpublished Master's Thesis. Dela Salle University-Dasmariñas.
[3]. Armbruster, B., & J. Osborn. 2001. Put reading first: The research building blocks for teaching children to read. Jessup, MD: National Institute for Literacy.
[4]. Beck, I. L., M. G. McKeown, & L. Kucan. 2002. Bring words to life: Robust vocabulary instruction. New York: Guilford.
[5]. Blachowicz, C., & P. Fisher. 2002. Teaching vocabulary in all classrooms. 2nd ed. Upper Saddle River, NJ: Merrill Prentice Hall.
[6]. Cunningham, A., &Stanovich, K. (2001). What reading does for the mind. Journal of Direct Instruction, 1(2), 137–149.
[7]. Fisher, D. 2007. Creating a schoolwide vocabulary initiative in an urban high school. Journal is Education for Students Placed At Risk, 12, 337-52.
[8]. Fisher, D., Grant, M., & Frey, N.. 2009. Science Literacy Is > Strategies. The Clearing House, 82, 183-186.
[9]. Kinniburgh, L. & E. Shaw Jr. 2007. Building reading fluency in elementary science through readers' theater. Science Activities, 44, 16-22.
[10]. Maheady, L., Michielli-Pendl, J., Mallette, B., & Harper, G. F. (2002).A collaborative research project to improve the performance of a diverse sixth grade science class. Teacher Education and Special Education, 25, 55-70.
[11]. Manila Times, Tuesday, July 6, 2004. The Sorry State of RP Public Education
[12]. Manila Bulletin.(2003, September). Educators Speak. Manila Philippines
[13]. Moncur, L. L. 2016. Does Science Vocabulary Instruction Increase Student Comprehension With 7th Grade Students In Middle School.Montana State University Bozeman, Montana
[14]. Vocabulary: Informal Assessmentsfile:///D:/ACTION%20RESEARCH/54582_Conderman_Ch_3.pdf

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FINANCIAL REPORT

Costing	**Amount in Php**
Internal/External Evaluator	1, 000.00
Editor	1, 000.00
Validator	1, 000.00
Typist	500.00
Transportation expense	500.00
Bond paper	1,000.00
Ink jet	2, 500.00
Food	1, 500.00
Reproduction of SIM	1000.00
Total	**10, 000.00**

ANNEX A

VOCABULARY KNOWLEDGE SCALE

1. Read the word in column one.
2. After you read the word, think about your knowledge of that word.
3. Select the column that matches your knowledge of the word.

a. If you have never seen that word before, check column 1.
b. If you have seen the word before, but you do not know what it means, check column 2.
c. If you think you know what the word means, write the meaning in column 3. d. If you have seen this word before and are sure you know what it means, write the meaning in column 4.
e. If you wrote the definition in column 4, go to column 5 and write the word in a complete sentence.

Points Awarded	1	2	3	4	5
Word	I've never seen this word before.	I've seen this word, but I do not know what it means.	I think it means . . .	I know this word. It means . . .	I can use this word in a sentence. My sentence is . . .
1. Homogeneous 2. Heterogeneous 3. Mixture 4. Solute 5. Solvent					

6.	Solutions					
7.	Colloids					
8.	Decantation					
9.	Evaporation					
10.	Filtering					
11.	Sieving					
12.	Insoluble					
13.	Substance					
14.	sedimentation					
15.	particles					

SCORING GUIDE:

For filling in Column 1, earn 1 point as indicated in the top row. For filling in Column 2, earn 2 points as indicated in the top row. For filling in Column 3, earn 3 points if the definition provided is correct, 2 points if it is incorrect, even if the student has attempted to fill out columns 4 and 5. For filling in Column 4, earn 4 points as indicated in the top row if the definition provided is correct. For filling in Column 5, earn 5 points as indicated in the top row if the sentence is both grammatically and semantically correct. If the sentence is not grammatically correct, 4 points are earned. If the word is not used appropriately in the sentence, 3 points are awarded.

0.01-1.00	Very low mastery
1.01-2.00	Low mastery
2.01-3.00	Moving Towards Mastery
3.01-4.00	Closely Approximating Mastery
4.01-5.00	Mastered

ANNEX B

PRETEST/POST TEST

Direction: Read and analyse the questions carefully. Choose and write the letter of the best answer.

1. Rio liked to surprise her younger sister with her favorite sweet dessert. First, she needed to dissolve a cup of sugar into cups of milk. She had to make this quick as it was almost dinner time. Applying what she learned in science, she dissolved the sugar fast and easy by

a. using cold milk and stirring constantly.
b. adding more milk and then stirring the mixture.
c. using more fine-grained sugar and decreasing the amount of milk.
d. warming the milk at low heat while continuously stirring as she added the sugar.

For item 2, use the following information.
Three substances P, Q, and S have the following properties:

P: soluble in water, soluble in alcohol, attract a magnet
Q: not soluble in water, not soluble in alcohol but attracts magnet
S: not soluble in water, soluble in alcohol, does not attract a magnet.

2. When P, Q and S are combined in 500 ml water, they formed mixture T. Which of the following can be mixture T?

a. Mixture T is heterogenous.
b. Mixture T is homogenous.
c. Mixture is in solid phase.
d. Mixture T is a solution

4. Three students dissolved sugar in water. The results were shown in the table below. Based on the table, what condition affects the dissolving time of the sugar in water?

Student	Amount of water (ml)	Amount of sugar (Teaspoon)	Temperature (^{0}C) of water	Dissolving time (s)
A	200	1	25	20
B	200	1	4	120
C	200	1	90	10

a. stirring b. water temperature
c. amount of water d. amount of sugar

4.Elisa sells cold buko juice in the school canteen. Everyday, she prepares jugs of buko juice for the pupils. For each jug, she mixes sugar, coconut meat, milk, and water. What must Elisa do so that the sugar she uses would dissolve faster?
a. Stirring
b. Crashing
c. Heating
d. Fanning

5. You prepared an orange juice drink by pouring 1/3 concentrated juice and ¾ water into the glass. You found out that the mixture is very sweet and not good for drinking. What will you do?
a. adds more water to the glass
b. adds more concentrated juice to the glass
c. transfer the mixture to a bigger and add more water
d. transfers the mixture in a bigger container and add more sugar

6. The children prepared a juice drink for their food festival by dissolving powdered juice in water. Which of the following is the solute and solvent in the solution?
I – Sugar is the solvent
II – Water is the solute
III - Sugar is the solute
IV– Water is the solvent
a. I, II
b. II, III
c. III, IV
d. I, IV

For items 7-9, use the following table:

Table 1 Types and Examples of solutions

Type of solution	**Example**	**Solvent**	**Solute**
Gas			
Gas in Gas	air	Nitrogen (gas)	Oxygen (gas)
Liquid			
Gas in Liquid	Carbonated water	Water (liquid)	Carbon dioxide (gas)
Gas in Liquid	Ocean water	Water (liquid)	Oxygen gas (gas)
Liquid in Liquid	antifreeze	Water (liquid)	Ethylene glycol; (liquid)
Liquid in liquid	vinegar	Water (liquid)	Acetic acid (liquid)
Solid			
Liquid in Solid	Dental amalgam	Silver (solid)	Mercury (liquid)
Solid in Solid	Steel	Iron (solid)	Carbon (solid)

7. Which of the following materials describe the combination of solid and solid?
a.antifreeze and steel
b. dental amalgam and steel
c. carbonated water and vinegar
d. ocean water and dental amalgam

8. Which of the following materials describe the combination of solid and liquid?
a.air
b. antifreeze
c. carbonated water
d. dental amalgam

9. Which of the following materials describe the combination of liquid and liquid?
a. antifreeze and steel
b. antifreeze and vinegar
c. Carbonated water and vinegar
d. ocean water and dental amalgam

10. Vicky is planning to make a liniment using pure coconut oil and eucalyptus leaves. What do you think will she do to produce the oil?
a. Heat the mixture until the water evaporates and oil remains on the pot
b. Let the sediments settle first before scooping the oil
c. filter the mixture to separate the oil
d. use strainer to separate the oil

Study the table below.

	Classification	**Mixture**
I	Heterogenous	Mixed nuts
II	Homogenous	Sugar solution
III	Heterogenous	Fruit salad
IV	Homogenous	Water and oil

11. Which of the following materials correctly classify into uniform (homogenous) and non-uniform (heterogenous).
a. I and II only
b. II and III only
c. I, III and IV
d. I, II, and III

12. Which of the following description possess/es by the homogenous mixture?
I. It is only one phase is seen or visible after mixing the different components.
II. The individual substances or the components are recognizable or remain distinct.
III. Mixtures that have substances that cannot de distinguished because solute completely dissolve in the solvent.
IV. Components can be identified immediately.
a. I, II
b. I. III
c. II, III
d. II, IV

13. Karlo had a fever. Her sister was instructed by mother to give him a medicine. How should her sister do it in order to avoid over dosage and poisoning?
a. Read label of the medicine and follow doctor's advice.
b. Give medicine without following instruction on its label.
c. Self-decision in giving in giving him medicine.
d. Ask mother on how to give medicine.

14. A research assignment about non-uniform mixture was given to you by your science teacher. She instructed you to perform an activity about it to be presented in class, how will you do it?
a. Tell the class that gelatin dessert is made up of powder granules and water and it is delicious.
b. Show how to make jam or jelly and let the class taste it for free.
c. Hold a glass of milk and explain that it is good source of protein and calcium. Drink it before bedtime.
d. present mixture of gaw-gaw + water (Almirol) and tell the class that flour particles dissolved evenly in water and has a tyndall effect when beam of light hit it.

15. Another task was given to you by your teacher after presenting your research assignment. She wanted to know how it is use.
a. Mayonnaise is use as food.
b. Plant's juice wee use to make cosmetic fragrance.
c. Paints were sold to all stores because it has protective and decorative functions.
d. Almirol is commonly used by launderer to make clothes clean and last longer.

16. Your sister is catching a cold, but your mother is not around; you don't know what medicine the best for cough is. You see an oregano in your garden you know that it is good for cough, how will you extract its juice?
a. Use a magnet to separate the juices.
b. Perform the physical manipulation.
c. Filter the leaves of the oregano.
d. Heat the leaves with water.

17. An oil spill is one of the environmental problems that occurs in bodies. Why is decantation the best way of separating oil spill from bodies of water?
a. It is a process of separating liquids from a solution.
b. It is a technique used in separating a soluble solid from a liquid.
c. It is a technique in which an insoluble solid is separated from liquid.

d. It is a technique used in separating a less dense substance from a denser one.

18. Kathy is planning to make a liniment using pure coconut oil and eucalyptus leaves. What do you think will she do to produce the oil?
a. Use strainer to separate the oil.
b. Filter the mixture to separate the oil.
c. Let the sediment settle first before scooping the oil.
d. Heat the mixture until the water evaporates and oil remains on the pot.

19. In a mixture of a salt and water, how will you separate the salt from the solution to recover the salt?
a. Heat the solution to evaporate the water.
b. Let the water pass through a fine cloth.
c. Sieved the salt one by one.
d. Pick the salt one by one.

20. Why is the process of evaporation important in salt-making?
a.Salt water will be saltier.
b. The sea water will become less.
c. There will be more salt to produce.
d. The salt particles are left after all the water evaporated.

21. How does filtration become useful for every household?
a. Filtration heats the water and makes it comfortable to drink.
b. Filtration adds impurities to the drinking water and makes our body healthy.
c. Filtration add minerals to the water and gives additional benefits to the body.
d. Filtration freed the water from soil particles and other unwanted substances.

22. You notice that your drinking water has small particles of sand. What method can you use to make it clean and safe to drink?
a. Manual separation c. Filtration
b. Evaporation d. Decantation

23. How can you separate soil particles from a jar of water?
a. Filter paper is used to separate the suspended particles.
b. Evaporation is a technique used to separate the materials.
c. Filtration is good in separating an insoluble solid from liquid.
d. Mixture withundissolved solutes can be separated by sedimentation.

24. You and your classmates are to bake a fluffy cake in your livelihood Education class. You need to see to it that the flour is very fine and free from lumps. What process of separating mixture can you used to remove the lumps?
a. Used a sieve to remove the lumps.
b. Bigger component like lumps can be picked up.
c. Stirring with spoon can make the flour very fine.
d. Pour water to the flour and used the method of filtration.

25. Renato was asked to separate small stone from the sand. Which of the following technique will best help him do the job?
a. sieving
b. Filtration
c. Using magnet

d. Decantation

26. Describe the process of separating mixture through magnet using the given illustration below. (sugar with iron filings)

a. filtration is good in separating insoluble materials
b. mixture of metal and non- metal be separated using a magnet
b. mixture with big and fine components can be separated by sieving
c. manual separation is the best method used for sorting substances

27. Mildred wants to remove the wires on the rice that she will be cooking. Using the knowledge on the process of separating mixtures, how will she do it? By___
a. using magnet c. filtration
b. using filter paper d. hand picking

28. Here is a picture, look at it closely. What do you mean by filtration? How do you describe filtration as one of the technique in separating mixture?

a. A method used to separate the soluble solid from solution
b. It is a method doesn't require any machines for its functioning
c. Filtration is the process of separating solid substances from liquid through the use of filter paper
d. It is a method in which heavier components of the mixture are separated from a lighter substance

29. Prepare a salt solution by dissolving salt in water. Place 10ml of salt solution in the evaporating dish. Heat the solution until the water evaporates and the salt remains in the evaporating dish. How did you separate the component of mixture?
a. Solution is heated to boiling point for the liquid to evaporate
b. Solid particles of salt remain after liquid evaporates
c. Solution of water and salt remains after evaporation
d. You obtain salt from the solution

30. What do you usually do to the rice with palay and small rocks before cooking?
a. Shaken the mixture to separate small rocks
b. You separate the components through physical manipulation

c. Mixture with big and fine components can be separated by sieving
d. You can use filtration if you want to separate small rocks from a mixture

31. In our daily lives we come across so many situations in which we have to separate some substances from a mixture to get suitable substance for use. What method did you use to separate rocks into different sized particles for road construction?
A. Filtration B. hand picking C. sieving D. Filtering

32. What will happen if we place gasoline in water?
a. the gasoline will rise into the water
b. the water and gasoline will both sink
c. the gasoline and water will mix evenly
d. nothing will happen to the gasoline and water

33. Raciel is cooking *sinigang.* She noticed that there are fats floating into it. This is because _____.
a. the pork is less dense
b. the fats are less dense
c. the vegetables are less dense
d. the sinigang mix is less dense

34. Joane is boiling a cup of water. After that, she noticed that the hot water is less than a cup. This is because _____.
a. there is a hole in the kettle
b. the water filtrates while boiling
c. Cynthia took water while boiling
d. the water evaporates while boiling

35. Chris went on a fieldtrip. He saw a salt plantation and asked his teacher how do salt produce. What should be the answer of the teacher?
I. the sea water evaporates as it is exposed to the sun
II. the salt maker spread salt into the field then allows it to multiply
III. the salt maker allows the sea water to evaporate then scrap the residues IV. the sea water is filtered then the residue is then piled and exposed to the sun
a. A. I and II c. I and III
b. B. II and III d. III and IV

36. On what situation does evaporation most likely to happen?
I. rainy days
II. a hot sunny day
III. cloudy with slight rain showers days
IV. stormy and windy days with heavy rain showers
a. I and II c. III and IV
b. II only d. IV only

For numbers 37-38

Filtration is the process of separating suspended solid matter from a liquid, by causing the latter to pass through the pores of some substance, called a filter. The liquid which has passed through the filter is called the filtrate. The filter may be paper, cloth, cotton-wool, asbestos, slag- or glass-wool, unglazed earthenware, sand, or other porous material. Filtration is very frequently employed in chemical technology, and it often presents great difficulties.

37. Which of the following is considered as a filtrate?
a. soil c. gravel
b. water d. marble

38. Which of the following are filters?
I. paper
II. cloth
III. cotton-wool
IV. clear plastic envelop

a. I and II c. III, and IV
b. I,II and III d. I, II, III and IV

39. Roi was tasked to perform filtration. Which of the following sets of materials must he use to perform his task?
a. mesh, funnel c. sand paper, flask
b. strainer, funnel d. distillation flask, strainer

40. Which of the following situations shows the process of filtration?
I. Boiling of sea water
II. Let the oil at water set in a glass
III. Use strainer in separating flour mixture
IV. Brewing coffee involves passing hot water through ground coffee and a filter
a. I only c. IV only
b. I and II d. III and IV

41. Which of the following uses sieving in separating its mixtures?
a. soil and water
b. rocks and sand
c. sea water
d. iron filings and sand

42. Mary Ann wants to know how sieving happens so she made an experiment. She prepared 4 sets of mixture to separate using strainer, which of the following sets of mixture prove that strainer can be used in separating mixtures?
a. oil and water
b. sand and pebbles
c. iron filings and sand
d. coffee powder and hot water

43. Engel is renovating his garage. He ordered a truck of sand to be used in the renovation. When his order came, the truck of sand was mixed with some gravel. What should he do?
a. request for the store to return his order
b. ask his brother to pick up the gravel individually
c. use a sieve or strainer to separate the sand from the gravel
d. just use the sand with the gravel to avoid additional work for him

44. Which of the following mixtures uses magnet to be separated?
a. oil and sand
b. sand and gravel
c. sea salt and sand

d. iron filings and sand

45. Lolo Percy accidentally dropped her box full of nails. What can he use to pick the nails easily?
a. magnet
b. sand paper
c. filter paper
d. distillation flask

46. During his class in Science, Joshua saw how the magnet and iron filings attract each other. Iron filings are attracted to magnet because _____.
I. magnets attracts all objects
II. iron is a ferromagnetic material
III. iron filings are made up of sticky materials
IV. iron filings are made up of plastic which are attracted to magnet
a. I and II c. II and IV
b. II only d. III only

47- 48. Using the given materials answer the following questions.
a. Materials: pepper, salt, beaker, magnet, sand, stirring rod, funnel, water, small basin strainer, iron fillings, filter paper
b. Task
Create a model or experiments using the materials above to demonstrate how certain mixtures can be separated. Construct your own procedures to show how certain mixtures can be separated?

49. Clear water may be collected from muddy water. Place a glass of muddy water on the top of a table. Allow the mud to settle. What do you call this method of separation?
a. Filtration b. Evaporation c. Decantation d. Chromatography

50. You are to perform the task of health personnel who encourages community to make their water from the well which contains soil and sand particles safe for drinking. What method did you use to separate the mixture?
a. Filtration b. decantation c. Distillation d. Evaporation

ANNEX C

INNOVATIVE INSTRUCTIONAL MATERIALS IN SCIENCE
FOR THE LEAST MASTERED SKILLS IN LOA

“SCIENCE MAGIC DICE”

Rationale

Science is interesting but difficult subject. To be able for the pupils to grasp every concept that they should learn, teachers must provide appropriate strategies suited for their learning preferences. According to Ambat (2010), some factors which contribute in the poor academic performance in science is the underdevelopment of the higher order thinking skills of the pupils in the previous grades which are very relevant in this subject and communication skill since Science is taught in English. Because of these factors, the proponent thinks of a way to be able for the pupils to comprehend the topic in the easiest and enjoyable way. For every topic that will be presented, it is important to unlock first the difficult words/terminologies that they may encounter in the lesson so that it will be easy for them to comprehend the whole concept of the lesson. Not just to give the meaning but this will be attain through the use of games in which the pupils are

familiar with. Nowadays, pupils are very fond of computer games. They spend most of their free time playing thus, the bases of the project.

Objectives

This innovative instructional material in Science for the Least Mastered Skill in Learning Outcome Assessment aims to:

1. Familiarize the pupils with the difficult words/terminologies that can be encountered in the topic.
2. Learn and understand the difficult words through the use of modified board games and enjoy at the same time.
3. Inculcate the value of cooperation, teamwork and sportsmanship to the pupils.

Details of the Project

The difficult words or Science terminologies are written in the cubes which served as the dice thus term "Science Magic Dice". The difficult words came from the list of topic with Least Mastered Skill in Learning Outcome Assessment in Science VI which include which include appearance and uses of uniform and non-uniform mixtures; techniques in separating mixtures such as decantation, evaporation, filtering, sieving and using magnet; and benefits of separating mixtures from products in community.

This Magic Dice will be used in playing different board games in which the children are very fond of playing. These games were incorporated in learning to be able for the pupils to learn and enjoy at the same time. These modified board games include Science Word Game, Science Word Search, Science Tic Tac Toe and Science Bingo.

Significance

This innovative instructional material in Science considered significant due to the following reasons:

1. Help the pupils to comprehend easily and enjoy the topics being presented.
2. Develop the critical thinking and highest order thinking skills of the pupils as well as their communication skill.
3. Inculcate the value of cooperation, teamwork and sportsmanship.

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ANNEX D

Sample DLL

DAILY LESSON LOG	**School:**	**KALUBKOB ELEMENTARY**	**Grade Level:**	**VI**
	Name	**LAMELAE-ANN B. BATO**	**School Head**	**VERNA D. AMBAT**
	Date:	**JULY 15, 2019- Monday**	**Quarter:**	**FIRST**

SCIENCE AND HEALTH
(7:20-8:10) TALINUM
(12:30-1:20) KADYOS

I. OBJECTIVES	
A. Content Standards	The learners demonstrate understanding of different techniques to separate mixtures.
B. Performance Standards	The learners should be able to separate desired materials from common and local products.
C. Learning Competencies/Objectives Write the LC code for each.	***Enumerate techniques in separating mixtures such as picking, winnowing, decantation, use of magnet, sieving, filtering, and evaporation. (S6MT-Id-f-2)***
II. CONTENT	***Separating Mixtures: Filtration***
	Approach: Collaborative ***Strategies: Jigsaw Method*** ***Activities: Think, Discuss, Act, Reflect***
III. LEARNING RESOURCES	

A. References	
1. Teacher's Guide pages	
2. Learner's Materials pages	
3. Textbook pages	
4. Additional Materials from Learning Resource (LR) portal	1. BEAM 4. 5 Explain what happens after Mixing Materials. Learning Guides. Mix it Up. July 2009. pp. 5-7. 2. EASE Science II. Chemistry Module 4. Lesson 2. 3. Chemistry III Textbook. Mapa, Amelia P., Ph.D., et al. 2001. pp. 42-45. 4. Science and Technology I: Integrated Science Textbook. NISMED. 2012. pp. 57-58.
B. Other Learning Resources	TeacherEngineering.n.d.https://www.teachengineering.org/activities/view/van_cleanupmess_act1 (accessed May52007) Science Intervention Materials (Science Magic Dice)
IV. PROCEDURES	
A. Reviewing previous lesson or presenting the new lesson	Drill – Vocabulary Enhancement Activity Using The Science Magic Dice, the pupil will recall the science terminologies use in the lesson and give some idea about it. 1. Mixture 2. Separation 3. Decantation 4. Filtration 5. filtering
	Think Jigsaw Puzzle The teacher will give cut-out pictures of methods of separating mixtures which the students will put together and explain after.
B. Establishing a purpose for the lesson	**Discuss** The teacher show picture of filtration device for water in the faucet and ask how it works.
C. Presenting examples/instances of the new lesson	**Act** Do Activity 5.3 Filtration Challenge. Teacher gives initial instructions about the activity.
D. Discussing new concepts and practicing new skills #1	Note: Water standards "A," "B" and "C" (C is filtered through some grass, B is filtered through a coffee filter, and A is filtered through 2 coffee filters with a paper towel in the middle).
E. Discussing new concepts and practicing new skills #2	
F. Developing mastery (leads to Formative Assessment 3)	

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G. Finding practical applications of concepts and skills in daily living	**Reflect** Why do we need to filter the water that we drink? What are the possible effects to us if we don't filter it?
H. Making generalizations and abstractions about the lesson	What are the things we need during filtration? What did you learn from our lesson for today?
I. Evaluating learning	The teacher will ensure that the students were able to come up with their output/worksheet.
J. Additional activities for application or remediation	
V. REMARKS	
VI. REFLECTION	
A. No. of learners who earned 80% in the evaluation	
B. No. of learners who require additional activities for remediation	
C. Did the remedial lessons work? No. of learners who have caught up with the lesson	
D. No. of learners who continue to require remediation	
E. Which of my teaching strategies worked well? Why did these work?	
F. What difficulties did I encounter which my principal or supervisor can help me solve?	
G. What innovation or localized materials did I use/discover which I wish to share with other teachers?	

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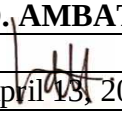
ANNEX E

DECLARATION OF ORIGINALITY, ANTI-PLAGIARISM, AND ABSENCE OF CONFLICT OF INTEREST

1. I, **Verna D. Ambat**, understand that plagiarism is an act of taking and using another's ideas and works and passing them off as one's own. This includes explicitly copying the whole work of another person or using some parts of their work without proper acknowledgment and referencing.
2. I hereby attest to the originality of this research proposal and have cited properly all the references used. I further commit that all deliverables and the final research study emanating from this proposal shall be of original content. I shall use appropriate citations in referencingother works from various sources.
3. I understand that a violation from this declaration and commitment shall be subject to consequences and shall be dealt with accordingly by the Department of Education.

Proponent: **VERNA D. AMBAT**
Signature: 
Date: April 13, 2020