Chapter 1

Introduction

A. Background of the Study

There are some who aren't into mathematics, in order to solve this problem the proponents come up with an idea of teaching mathematics, sequences, together with fun and excitement of playing cards with the mathematical concept attached to it.

A playing card is a piece of specially prepared heavy paper, thin cardboard, plastic-coated paper, cotton-paper blend, or thin plastic, marked with distinguishing motifs and used as one of a set for playing card games.

Using the concept of card games, the proponents will use Sequence as main concept in this game specifically arithmetic and geometric sequences.

Besides the benefit of giving students a break from worksheets, math card games are an effective multisensory reinforcement tool. "The cards enable a concrete and user-friendly introduction to, and motivator of, the more formal and abstract concerns of several branches of academic mathematics" (Baker, 1999).

It is indeed essential to master this concept to be able to know more about sequences, to demonstrate understanding of the types of it and how it is utilize in our own living.

With this, the students will not just learn but will enjoy and have fun also.

B. Review of Related Literature and Studies

Acing Math (One Deck At A Time!) A Collection of Math Games.The Positive Engagement Project believes it is possible for a teacher to make the material and activities they use challenging and still have fun in their classroom. We know time is one of the biggest obstacles in teaching, so the said project compiled a collection of engaging math games, ranging from Kindergarten to the upper elementary grades, using only an ordinary deck of playing cards. These games have been created by The Positive Engagement Project or found online to help make math entertaining and lively. Acing Math provides extra repetition and creative ways to practice the same thing using the same set of cards in a variety of ways making it seem new and different.

Math card games provide an excellent source of multisensory support as part of a well rounded educational program. What a card game does is give the students something to hold, touch, and move around while they see the facts on the cards and say them as well. Manipulating the cards in a variety of games, whether it is matching, making decisions on which answer is higher, or creating groups of similar attributes, is a highly effective multisensory tool. “Cards provide a manipulative that is inexpensive, easily stored and kinesthetically accessible to most humans. The standard deck is imbued with a rich mix of patterns and symmetries that are visually recognizable” (Baker, 1999).

When you play a card game there are a limited amount of facts that can be used. In a regular deck of cards there are four of each number; as a result, when playing a card game, the same fact will present itself over and over again, allowing the students plenty of opportunity for repetition to support the objective of the given lesson.

Sequence. A function whose domains is the finite set {1,2,3,….n} or the infinite set {1,2,3…}. Arithmetic Sequence is a sequence where every term after the first is obtained by adding a constant called a **COMMON DIFFERENCE**

Geometric Sequence is a sequence where every term after the first is obtained by multiplying a constant called **COMMON RATIO.**

C. Statement of the Problem

The purpose of this study is to determine the effectiveness of the game entitled Sequence It as a better tool in mastering the concept presented in it.Specifically; this study seeks on answering the following questions:

1. What is the performance level of the respondents in

   a) Pretest?

   b) Post-test?

2. Is there a significant difference between the scores of the students who played the game and those who did not?

D. Hypotheses

Null Hypothesis

There is no significant difference between the scores of the students who played the game and those who did not.

Alternative Hypothesis

There is a significant difference between the scores of the students who played the game and those who did not.

E. Significance of the Study

Some people encounter difficulty in subjects, primarily, Mathematics. In order to solve that problem, the proponents think of a way on how to make it easier to understand and that's why this game is created.

Teachers can go crazy thinking of different ways to practice the same facts to help students learn without getting bored.

Since this game displays a substantial application of the concept of sequences students will therefore depart from the long time mindset which makes mathematics appear boring in discussion. Keeping our students interested, active, and engaged makes a significant difference in the overall learning experience and we believe this collection of math games will do just that.

F. Scope and Delimitation

Since the mathematical concept being discussed in this game is Sequences, the players were asked to form sequences and to determine the common ratio and common difference in the formed sequence. This is only limited in creating arithmetic and geometric sequences. Only the students that has the idea about sequences or the students who already discussed sequences are the one who will really appreciate this game.

Chapter II

Methodology

MATERIALS:

Playing Cards

Materials needed in making the Playing Cards

- Cards
- Double-sided Tape
- Printed Numbers and Logo

Procedure:

Make and design your cards by adding Logo .Then paste the printed numbers in the cards.

Definition of terms:

1. Arithmetic Sequence- is a sequence where every term after the first is obtained by adding a constant called a common difference.

2. Geometric Sequence- is a sequence where every term after the first is obtained by multiplying a constant called common ratio.
3. Sequence- a function whose domains is the finite set {1,2,3,….n} or the infinite set {1,2,3…}

4. Playing Cards- used for playing a variety of card games, with varying elements of skill and chance, some of which are played for money. Playing cards are also used for illusions, cardistry, building card structures, cartomancy and memory sport.

Players and Materials:

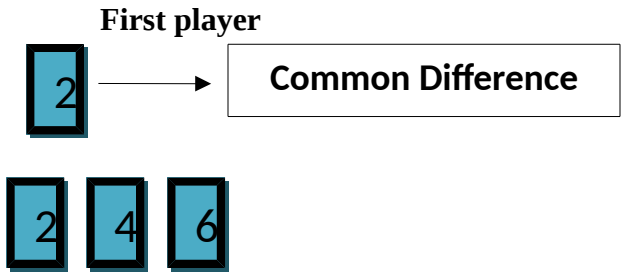
1. The game is played by maximum of 3 players
2. To determine the first player, the players will pick one card, and the one who gets the highest number of value in the cards should be the first one to play the game.
3. Each player is entitled to 12 cards, but the first player shall have additional 1 card.

The Game

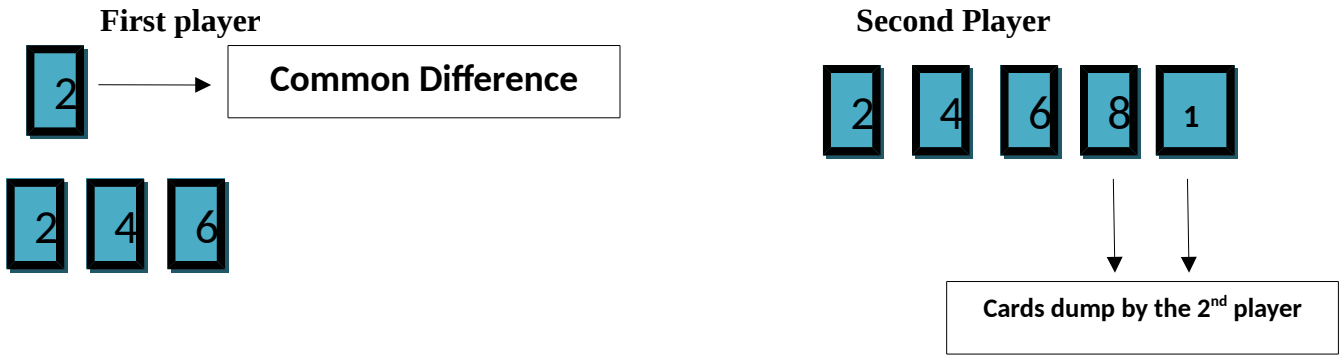
The players will form a sequence using the cards; it can either be arithmetic and geometric sequence. But the players should reassure that there are common ratios or common differences found on the sequence they form.

The game begins when the first player dumps a sequence of cards (he can't dump the cards if these don't have common ratio or difference) but the decision also relies on the first player- whether he will dump the cards that form a sequence or give a card to the next player in order for him to not dump his cards.

Example:



It's the turn for the next player to play the game. He can form a new sequence using the cards he has and if the previous player dumped a card to him, he will have to use the said cardor continue the sequence formed by the first player (if the first player dumped his cards).



If the previous player, dumped a car to the next player, he must use the said card. And he can also get one card from the central deck.

If the player is able to use all of his or her cards in combinations, by connecting to opponents' or the exposed card sets (*sapaw*), or if the player gets rid of all his cards, then the player wins.

Scoring

Since the objective of the game is to empty the player's hand of all cards or minimize count, the one who gets rid of all the cards or has the least value of cards left at the end, wins the game.

Application / Respondents

The respondents of this study were selected from a grade 10 class of LNHS. The researcher chose 18 students and those 18 students took the pre-test and the 9 students who got the lowest scores belong to the experimental group and the other 9 students belong to the controlled group. Experimental research was employed in this study. Table 1 below shows the score distribution of respondents in the pre-test.

Respondents of the Study

Scores	Experimental Group	Controlled Group	Total
10	**0**	**0**	**0**
9	**0**	**1**	**1**
8	**0**	**3**	**3**
7	**0**	**4**	**4**
6	**4**	**1**	**5**
5	**2**	**0**	**2**
4	**3**	**0**	**3**
Total	**9**	**9**	**18**

Testing the Functionality and Effectiveness

To determine the effectiveness of the game Sequence It, the lowest 18 non-passers were divided into two groups, the controlled and experimental.

The controlled group was not able to receive an experimental treatment, rather they were taught through pure discussion and given exercises. The experimental group on the other hand was given the chance to play the game and mastered it. After which, a post test was conducted to

the 2 groups. The scores were treated statistically through the following tools: frequency count, mean, performance level, mastery level, and t-test for independent samples.

CHAPTER III

RESULTS AND DISCUSSIONS

This chapter focuses on the findings of the research. After the respective processes and applications applied on the 2 groups, the data was drawn from the results as shown in **Table 1**. The experimental group showed an increase of 26.67% in the performance level which extended from the initial of 51.11% in the pre-test to 77.78% in the post test. The controlled group on the other hand, had an increase in the performance level reaching to -30% from the initial PL of 75.56% in the pre-test to 74.44% in the post test. This definitely exhibits that there is greater increase in the performance level of those who played the game than those who did not.

Table 1

Test Results of the Respondents

Experimental Group				Controlled Group			
Student	Pre-test	Post-test	Increase	Student	Pre-test	Post-test	Increase
A1	6	7	1	A2	7	9	2
B1	6	7	1	B2	7	8	1
C1	4	7	3	C2	7	7	0
D1	5	7	2	D2	6	4	-2
E1	6	10	4	E2	9	8	-1
F1	5	6	1	F2	8	8	0
G1	4	10	6	G2	8	8	0
H1	6	8	2	H2	8	8	0
I1	4	8	4	I2	8	7	-1
Mean	5.11	7.78	2.67	Mean	7.56	7.44	-0.11
PL (in %)	51.11	77.78	26.67	PL (in %)	75.56	74.44	-1.11

Table 2

Scores of the students in pre test

Scores	**Experimental Group**	**Controlled Group**	**Total**
10	**0**	**0**	**0**
9	**0**	**1**	**1**
8	**0**	**3**	**3**
7	**0**	**4**	**4**
6	**4**	**1**	**5**
5	**2**	**0**	**2**
4	**3**	**0**	**3**

Total	**9**	**9**	**18**

Table 3

Scores of the students in post test

SCORE	CONTROLLED GROUP	EXPERIMENTAL GROUP	TOTAL
10	**0**	**2**	**2**
9	**1**	**0**	**1**
8	**3**	**2**	**5**
7	**3**	**4**	**7**
6	**1**	**1**	**2**
5	**0**	**0**	**0**
4	**1**	**0**	**1**
TOTAL	**9**	**9**	**18**

Table 2 shows the scores of the students in the pre test while Table 3 shows the scores of the students in post test.

Statistical Tool

The researcher used the t-test for independent samples in finding if there is a significant difference between the pre test and post test. T-test for independent samples is a test of difference between two independent groups and the means are being compared. So the researcher used this because it is a more powerful test compared with other tests of difference of two independent groups.

$$t = \frac{T'1 - T'2}{\sqrt{\left(\frac{SS1 + SS2}{n1 + n2}\right)\left(\frac{1}{n1} + \frac{1}{n1}\right)}}$$

Table 4

Statistical Test on the Significant Difference on the
Scores of the Experimental and Controlled Groups at α = .05

Indicator	df	Computed Value	Critical Value	Decision	Interpretation
Scores in the test	18	4.1	2.101	Reject Ho	Significant

Having the data calculated using the t-test on independent samples from the given df of 18, computed value of 4.1 and the critical value of 2.101 at α = .05, it is evident from the computation that the null hypothesis is rejected. It is concluded that there is a significant difference between the scores of the controlled and experimental group. Thus, the game is very effective as a tool in increasing the performance level in arithmetic and Geometric Sequence.

CHAPTER IV

Conclusions and Recommendations

Based on the findings, the following are the conclusions formed.

1. It appeared in the results that there was an increase in the performance level of the respondents. The remarkable increase is noted in the experimental group.
2. There is a significant difference in the scores of the experimental and controlled group; and it is in favor of the experimental group.
3. The game is an effective aid in learning arithmetic and geometric sequence.

The following statements are the recommendations of the researchers:

1. The game entitled “Sequence It” should be used by the students since it is proven through research that it is effective in learning Geometric and Arithmetic Sequences and finding the common ratio or common difference.
2. It is also recommended that the game can be used by the teacher in teaching students about geometric and arithmetic sequence.

Furthermore, it was recommended that the game must have a platform so that there will be a fixed place on where the cards will be placed. And lastly, it is recommended add more numbers in the cards.

Bibliography

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APPENDICES

Appendix A – Pre/Post Test

Pre-test

1. What is the common difference of the sequence 3, -3,-9,-15,...n?
2. What is the next term in the sequence 11, 18, 25, 32,_____?
3. Find the third arithmetic mean in the sequence -3,_,_,_,_, 17.
4. Insert two arithmetic means in the sequence -5, 0, _,_, 15.
5. What is the 11^{th} term in the sequence 15, 11, 7,3.....n?
6. What is the common ratio of the sequence 12, 48, 192?
7. The next term in the sequence 3, 9,27 is __ .
8. What is the missing term in the sequence -2,_,-50,250?
9. What is the 2^{nd} geometric mean of the sequence 3,_,_,_,48?
10. What is the 5^{th} term on the sequence 2,8,32 ...n?

Post test

1. Find the common difference in the sequence -11,-8,-5,-2,...
2. Find t_{18} : -9,-7,-5,-3,...
3. -12,__,__,__,_?_,43
4. Find the missing term in the sequence 6,18,30,__,54.
5. -5,_?_,_?_,7
6. What is the next term in the sequence 1,6,36,___?
7. What is the common ratio of the sequence -2,14,-98,686?
8. Find t_6 : 2,4,8,...n.
9. -1,_?_,_?_,-27
10. What is the missing term in the sequence 2,6,__,54,162?

Appendix B- Pictures

