CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Development in almost all areas of life is based on effective knowledge of mathematics and science. Mathematics at the primary school level in Ghana emphasizes knowledge and skills that will help pupil to develop the foundation for numbers.

The pupil is expected to be able to read and use numbers competently, reasonably, logically to solve problems and communicate mathematical ideas effectively. The pupil's mathematical knowledge, skills and competence at this stage should enable him/ her to make more meaning of his word, and also develop interest in mathematics.

Addition is one of the most important operations in mathematics. There cannot be any meaningful development in virtually any area of life without the knowledge of mathematics. Many mathematical concepts such as fractions, integers and initial ideas gained from addition. The concept of addition is mostly done in the early stage in the primary school. This helps them to apply the knowledge gained to do further addition in fractions and integers.

Furthermore, when children grasp the concept of addition, it helps them in the study of other operations as multiplication and subtractions. The pupils being studied are unable to write the numbers whose sum is less than ten (10) correctly in their book an if this

anomaly is not corrected, immediately, the child would find it extremely difficult to study and understand several concepts in mathematics.

1.2 **Statement of the Problem**

The problem to be solved is helping the pupils in primary one (1) to use the Cuisenaire rods to solve the problem of addition of whole numbers from 1-9 whose sum is less than 10.

The researcher aims at helping the pupils to be able to associate themselves to the colours of the rods and their values more quickly and finding addition with rods easier and quicker than using sets. The rods will be prepared and used to teach the children addition of whole numbers 1-9. The pupils will be taught the colours first before the position.

After a recent lesson on addition of whole numbers whose sum is less that 10 it was found out that the pupils were finding it difficult to cope with the problem even though the pupils were introduced to eh topic with teaching learning materials such as bottle top, counters etc. In view of this the researcher has made her mind to use the Cuisenaire rods to teach the pupils.

1.3 **Purpose of the Study**

Purpose as defined by Oxford Advanced Learned Dictionary is the intentions or the aims of something, the things that something is suppose to achieve.

The purpose of this study is for the researcher to help the pupil in primary 1 to use Cuisenaire rods to solve addition of whole numbers 1-9 whose sum is less than 10. The researcher has laid down the following as her purpose of the study.

i. To help the pupils identify the colours of the Cuisenaire rods.

ii. To help the pupils to identify the values of the rods.

iii. Associate the rods with the numbers much more quickly.

iv. Do addition of whole numbers 1-9 whose sum is less than 10 using the Cuisenaire rods much faster those other methods.

1.4 **The Research Questions**

The researcher has laid down the following research questions.

a) Are pupils able to identify the colours of the Cuisenaire rods?

b) Can pupils identify the positions of the Cuisenaire rods?

c) Are pupils able to associate the Cuisenaire rods with the numbers?

d) Are pupils able to solve t he problems of addition of whole numbers 1-9 using the Cuisenaire rods?

1.5 **Significance of the Study**

The Oxford Advanced Learner's Dictionary explains significance as the importance of something especially when it has effects on what happens in ht future.

Development in almost all areas of life is based on mathematics. A main significance of this research is that it will help the pupil to adjust and handle number work.

Another significance of this research is that it will help pupil to perform number operations especially in dealing with addition of whole numbers 1-9 whose sum is less than 10.

More to the significance is that if the child is able to do this addition from the onset it is going to help the child to use mathematics in daily life by recognizing and applying appropriate mathematical problem-solving strategies.

It will also help the child to make use of appropriate strategies of calculation.

1.6 **Limitations**

The limitations of the study identify potential weakness of the study. One of he potential weakness of their action research is the ability of the child to identify the colours of the rods.

Another limitation is for the child to do the addition using the rods and get it correct. Also the problem of finance is another problem faced by the researcher in preparing he materials.

1.7 **Delimitations**

The delimitations also indicate how the scope of the study has been narrowed. Although the methods used to do addition are many such as union of sets, using the number track, using the number line, the researcher delimited her only to he use of Cuisenaire rods to solve ht problem of addition.

Other researchers to help pupils solve the problems of addition can use the other methods.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The literature review talks on what other authorities have said about the use of Cuisenaire rods to solve the problem of addition it gives additional information on the research work and this helps the researcher to know what other educationists have said about the topic under investigation. The review o related literature helps the researcher to avoid unintentional replication of previous studies.

The Cuisenaire rods were named after their inventor Georges Cuisenaire (1891 - 1976) a Belgium Primary School teacher who published a booklet on their use in 1952 called “less nombres en couleures”. In the system, there are 10 rods measuring 1cm to 10cm. Rods of equal length are assigned the same colour. The rods follow this system.

White	1cm
Red	2cm
Green	3cm
Purple	4cm
Yellow	5cm
Dark Green	6cm
Black	7cm
Brown	8cm
Blue	9cm

Orange 10cm

The system was used in primary schools in the United Kingdom a number of years during the mid sixties. This indicates that Cuisenaire rods can be used for effective teaching for pupils to understand.

Seton Pollock (1961) produced the colour factor system, which was very useful. Seton said the use of colors in teaching pupils in the basic schools help the pupils to concentrate on the lesson since ht colours attracted the pupils. Seton concluded that the use of coloured teaching learning materials help pupils to pay much attention to the teacher and this facilitates understanding.

Elizabeth Williams and Hilary Shuard (1982) - Primary Mathematics Today. They also added that Cuisenaire rods could be used to teach the pupils cardinal and ordinal aspects of number. Before a pupil can do addition with Cuisenaire rods the child needs to know the positions of the rods in so doing the child is leaning both cardinal and the ordinal aspects of number. The ordinal aspects of numbers indicate the position of a number in series.

JSSTEP (2002) asserted that the use of Cuisenaire rods to teach the pupils helps them to know ht length of the rod which one is longer than the other. Example, red, which is 2cm, is longer than white, which is 1cm long. The use of the rods helps pupils to learn

the positions of numbers. When they know the positions o the numbers it becomes easy for them to do the addition using the Cuisenaire rods.

Juliet Donkor Daniel Apronti and Michael Ampiah (2005) said that the use of the Cuisenaire rods would help the pupils to understand and remember the additional bonds since the pupils are bale to do addition with the Cuisenaire rods.

John Mullen also said that Cuisenaire rods are not only used for mathematical lessons but also in the language classroom to teach verb tense system, a dynamic presentation using Cuisenaire rods.

2.1. Summary

From the above it can be said t hat Cuisenaire rods were named after their inventor who is Georges Cuisenaire a Belgian primary school teacher learning material to help pupils to solve the problem of agitation without any difficulty. Seton Pollock (1961) also produced the colour factor.

Elizabeth Williams (1982) said Cuisenaire rods could be used to teach cardinal or ordinal aspect of number. JSSEP (2002) asserted that the Cuisenaire rods help students to learn the length of numbers Juliet Donkor, Daniel Apronti and Michael Ampiah (2005) said that the use of Cuisenaire rods will help pupil to remember what hey have learnt already and it also facilitates understanding.

From what other authorities have said about the use of Cuisenaire rods, it can be said that Cuisenaire rods have come to help teachers to make their work very easier if only they will take the pain to prepare the materials and use it appropriately to teach the pupils.

CHAPTER THREE

METHODOLOGY

This chapter explains how the study will be conducted. Therefore this chapter will concern itself with the materials used to prepare, the Cuisenaire rods, detail description of Cuisenaire rods, how it is prepared and how it will be used to help the pupil to solve the problem of addition. This chapter will also talk about the population and population sample.

3.1 Materials

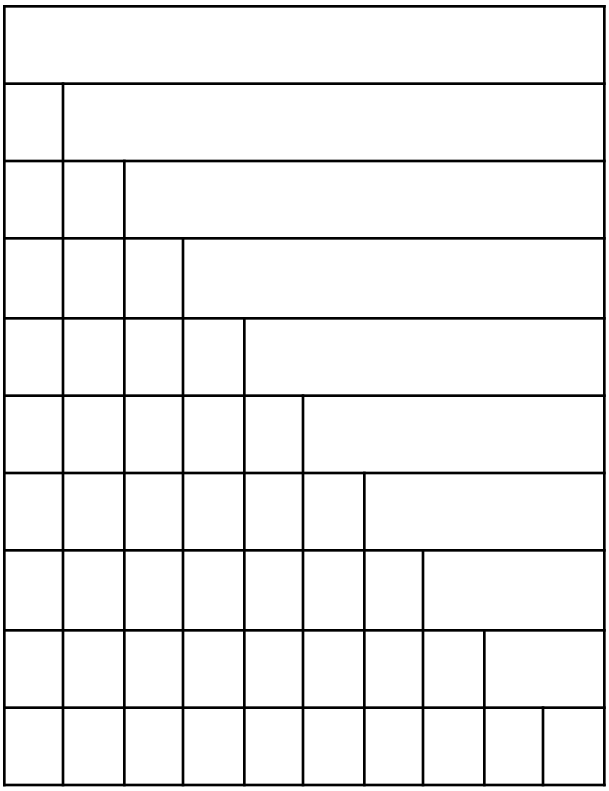
Wood, try square, smoothen play / carpenter's ruler, and colours.

3.2 Construction of Material

Cuisenaire rods are made of ten rectangular wooden blocks in various sizes and colours as suggested in the illustration below. The one unit fits exactly into "X" number of time with other blocks.

How to Make Cuisenaire Rods

To make Cuisenaire rods, have a piece of wood smoothly planed with the cross-section cut measuring 1.0cm * 1.0cm, measure, cut and colour dimension given to teach of the ten Cuisenaire rods as illustrated below.



1unit

2units

3units

4units

5units

6units

7units

8units

9units

10units

1. White __1.0cm × 1.0cm

2. Red __1.0cm × 1.0cm

3. Green __1.0cm × 1.0cm

4. Purple __1.0cm × 1.0cm

5. Yellow __1.0cm × 1.0cm

6. Dark Green __1.0cm × 1.0cm

7. Black __1.0cm × 1.0cm

8. Brown __1.0cm × 1.0cm

9. Blue __1.0cm × 1.0cm

10. Orange __1.0cm × 1.0cm

After the problem of addition of whole numbers whose sum is less than 10 had been detected there was the need to find a solution to the problem having considered a number of intervention, the researcher came by using the Cuisenaire rods to solve the problem. The Cuisenaire rod is associated with colours and numbers.

White __ **1**

Red __ **2**

Green __ **3**

Purple __ **4**

Yellow __ **5**

Dark Green __ **6**

Black __ **7**

Brown __ **8**

Blue __ **9**

Orange __ **10**

Therefore, in using the Cuisenaire rod to introduce addition of whole numbers whose sum is less than 10, the researcher compared the rods. For example 2 + 4. The red is 2 and the purple rod is 4. Therefore, I laid the red rod and the purple rod. I compared with the red rod, which has the same length as the two rods join together.

Red	Purple
Dark Green	

Example **1.**

Therefore, this shows that 2 + 4 = 6

Example **2.**

Yellow	Green
Brown	

This shows that $5 + 3 = 8$