Resolving the Difficulties in Solving LCM and HCF Problems among VI Standard Students

ACTION RESEARCH REPORT

PRACTITIONER

Mrs. M.Kalaignanaselvi

Lecturer,

DIET, Krishnagiri.

Submitted To

STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING, CHENNAI-6

April-2024

DISTRICT INSTITUTE OF EDUCATION AND TRAINING
KRISHNAGIRI

ACTION RESEARCH

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I express my sincere thanks to our respectful Mrs.S.Latha, Director, SCERT and Joint Directors, SCERT, for permitted me to take up this study and granted finance.

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I express my sincere thanks to the Head Master and Math Teachers in GBHSS Rayakottai for their co-operation to complete this action research.

I express my sincere gratitude to all my colleagues for their suggestions in completing this work.

Place: Signature of the Practitioner

Date:

DECLARATION

` I hereby declare that Action Research entitled "Resolving the Difficulties in Solving LCM and HCF Problems among VI Standard Students", is submitted by me to the SCERT Chennai in the year 2022-2023 is the result of our original and independent Action Research work carried out under the co-ordination of Dr.V.Hemalatha, Principal, DIET, Krishnagiri. This work has not submitted earlier for completing any Action Research work or other similar titles in this or any other institution.

Signature of the Practitioner

M.Kalaignanaselvi,
Lecturer,
DIET, Krishnagiri.

CERTIFICATE

Dr.V.Hemalatha

Principal

DIET, Krishnagiri.

Certified that this Action Research work entitled **"**Resolving the Difficulties in Solving LCM and HCF Problems among VI Standard Students**",** is done by Mrs. M.Kalaignanaselvi, Lecturer, DIET, Krishnagiri, the report has been submitted to State Council of Educational Research and Training, Chennai-6.

Principal

DIET, Krishnagiri

Executive Summary

1. Introduction:

Finding factors and multiples is an essential part of mathematics. The use of these concepts starts from an early age, when young students are working on multiplication and sharing. In school mathematics it is built on over the years and these concepts are used in very high-level mathematics as well. In secondary school, students are required to study the HCF (highest common factor) and LCM (lowest common multiple) of numbers. They have to be able to apply this knowledge when working with expressions. These topics and concepts are thus studied at different times, and in different years. Therefore, students can fail to see connections between the different aspects that they study, and their knowledge can become fragmented as a result. Students often rely on memorization at each stage rather than understanding the underlying principles leading to a lack of appreciation of the power of factors and multiples.

2. Need and Significance of the problem:

During the school visit many of the students have struggle in doing LCM (lowest common multiple) and HCF (highest common factor) problems. While interacting with the students, they have the problem to understand the factors and multiples concept. Hence the topic has been chosen for this action research.

3. Statement of the problem:

Resolving the difficulties in solving LCM and HCF problems among VI standard students

4. Limitations of the Study:

- This problem was limited to VI standard students
- This problem was limited to students of VI standard in GBHSS Rayakottai alone

5. Objectives of the study:

- ❖ To resolve the difficulties of students in solving LCM and HCF problems.
- ❖ To explore the new strategies in teaching LCM and HCF problems.
- ❖ To find out the difficulties of students in solving LCM and HCF problems.

6. Hypothesis:

There is no significant difference between the pre-test and post-test scores among the students in solving LCM and HCF problems.

7. Research Design:

Single Group Experimental Design

(a) Sample:

31 VIth standard students in GBHSS-Rayakottai in Kelamangalam block are selected as sample for this study.

(b) Tool:

A Questionnaire was prepared by the practitioner for Pre-test and Post-test. The tool consists 20 one mark questions. Questions based on teaching strategies in classroom transaction. Questionnaire was prepared in Tamil language .

(c) Intervention:

- Working model practice- LCM and HCF Using Beads and Strings,Using Manipulative Blocks,
- ICT activity-GeoGebra,
- Play way activity- Factor Scavenger Hunt, LCM and HCF Bingo,
- Worksheets-4

8. Findings:

- ★ The intervention significantly improved students' performance in solving LCM and HCF problems, as evidenced by a substantial difference between pretest and post-test scores.
- ★ On average, students scored 11.7% in the pretest and 63.06% in the post-test, indicating a remarkable improvement.

- ★ Students demonstrated enthusiasm and receptiveness towards learning in reformed classroom environments.
- ★ The intervention not only led to a significant improvement in students' ability to solve LCM and HCF problems but also fostered a deeper understanding of the underlying concepts.
- ★ Qualitative feedback from students highlighted a newfound confidence in tackling mathematical challenges related to factors and multiples.
- ★ Observations during the intervention revealed increased engagement and participation among students, indicating a positive impact on classroom dynamics.
- ★ The incorporation of hands-on activities and technological tools facilitated a more interactive and experiential learning experience, resulting in heightened student interest and motivation.
- ★ Teachers reported enhanced efficacy in delivering lessons on LCM and HCF, attributing this to the adoption of reflective teaching practices and a better understanding of students' individual learning needs.

9. **Suggestions**:

- Teachers can master more reflective teaching practices in class room transaction.
- Teacher should check the pre knowledge of the students then plan the strategy according to students pre knowledge.
- Teachers who use pedagogical content knowledge (PCK) may develop high teacher self-efficacy beliefs, which can result in further effective teaching and learning.
- Flipped classroom definitely encourage students learning participation.
- Technology creates a good sound in teaching and learning process. Especially in mathematical teaching technology reduce students hard thinking. It gives concreate explanation.

10. Conclusion:

Through the implementation of innovative teaching methodologies and targeted interventions, this actin research has demonstrated significant strides in addressing the challenges faced by VI standard students in comprehending concepts related to factors and multiples, particularly in solving LCM and HCF problems. The findings underscore the importance of adopting diverse pedagogical approaches, such as hands-on activities, technology integration, and reflective teaching practices, to enhance student engagement, understanding, and performance in mathematics. Moving forward, it is imperative for educators to continue exploring and refining teaching strategies that cater to the diverse learning needs of students, thereby fostering a conducive learning environment that promotes mathematical proficiency and confidence among learners. By embracing these approaches, educators can play a pivotal role in empowering students to navigate mathematical concepts with proficiency and enthusiasm, laying a solid foundation for their academic success and lifelong learning journey.

CONTENTS

RESOLVING THE DIFFICULTIES IN SOLVING LCM AND HCF PROBLEMS AMONG VI STANDARD STUDENTS

1.INTRODUCTION:

Finding factors and multiples is an essential part of mathematics. The use of these concepts starts from an early age, when young students are working on multiplication and sharing. In school mathematics it is built on over the years and these concepts are used in very high-level mathematics as well. In secondary school, students are required to study the HCF (highest common factor) and LCM (lowest common multiple) of numbers. They have to be able to apply this knowledge when working with expressions. These topics and concepts are thus studied at different times, and in different years. Therefore, students can fail to see connections between the different aspects that they study, and their knowledge can become fragmented as a result. Students often rely on memorization at each stage rather than understanding the underlying principles leading to a lack of appreciation of the power of factors and multiples.

Introduction to LCM (Least Common Multiple) and HCF (Highest Common Factor):

In the realm of mathematics, the concepts of Least Common Multiple (LCM) and Highest Common Factor (HCF) play crucial roles in solving problems related to integers. These concepts find practical applications in various real-life situations, offering valuable insights into the world of numbers and their relationships.

LCM (Least Common Multiple):

The Least Common Multiple of two or more integers is the smallest positive integer that is divisible by each of the given numbers without leaving a remainder. LCM is often employed in real-life scenarios where periodic events or cycles are involved. Consider scenarios like scheduling, where the LCM helps determine the time at which different events will coincide or repeat simultaneously.

For instance, imagine a scenario where two friends decide to meet at a park. One friend visits the park every 4 days, while the other visits every 6 days. The LCM of 4 and 6 (which is 12) will reveal when both friends will meet at the park on the same day. In this way, LCM is a useful tool for synchronizing events and managing recurring patterns in various contexts.

HCF (Highest Common Factor):

The Highest Common Factor, also known as the Greatest Common Divisor (GCD), is the largest positive integer that divides two or more numbers without leaving a remainder. HCF has applications in real-life situations involving resource distribution, where one needs to find the largest common factor to distribute resources efficiently.

Consider a scenario where a farmer has a certain quantity of land that needs to be divided into equal-sized plots. The HCF of the dimensions of the land can help determine the maximum size of the plots that ensures optimal utilization of the available space. In this way, HCF provides a practical solution for dividing resources into equitable portions.

In conclusion, the concepts of LCM and HCF are not just abstract mathematical ideas but have tangible applications in various real-life situations. From scheduling events to optimizing resource distribution, these concepts provide valuable tools for solving practical problems and making informed decisions in diverse fields.

Difficulties faced by students in solving LCM and HCF problem.

Students may encounter several challenges when solving problems related to Least Common Multiple (LCM) and Highest Common Factor (HCF). Here are some common difficulties faced by students:

1.Understanding the Concepts:

LCM and HCF are abstract concepts that may be challenging for some students to grasp initially. Understanding the fundamental principles behind these concepts can be a hurdle.

2.Confusion in Definitions:

Students might mix up the definitions of LCM and HCF. It's crucial for them to clearly distinguish between finding the smallest common multiple (LCM) and the largest common factor (HCF) of numbers.

3.Complexity of Calculations:

As problems involving LCM and HCF often require multiple steps of calculation, students may struggle with the complexity of these calculations, especially when dealing with larger numbers.

4.Factorization Challenges:

Factorizing numbers is a key step in finding both LCM and HCF. Students may face difficulties in identifying the prime factors of numbers, leading to errors in subsequent calculations.

5.Choosing the Correct Method:

Knowing when to use LCM or HCF can be a source of confusion. Students may find it challenging to determine which concept is most appropriate for a given problem.

6.Application to Real-Life Situations:

Linking LCM and HCF to real-life scenarios may be challenging for some students. Understanding how these concepts are used in practical situations can be crucial for a deeper comprehension.

7.Lack of Practice:

Regular practice is essential for mastering any mathematical concept. Students who do not practice enough may struggle to apply LCM and HCF concepts effectively.

8.Fear of Word Problems:

Word problems that involve LCM and HCF can be intimidating for students. Translating real-life situations into mathematical expressions and equations can be a skill that students need to develop.

9.Multistep Problem Solving:

Problems involving LCM and HCF often require multiple steps. Some students may struggle with organizing their thoughts and executing the steps in the correct order.

10.Time Management:

The process of finding LCM and HCF can be time-consuming, especially for larger numbers. Students may face challenges in managing their time effectively during examinations or assignments.

How to resolve the difficulties in solving LCM and HCF problems using different pedagogy

Addressing difficulties in solving LCM and HCF problems requires a combination of effective teaching strategies and engaging pedagogical approaches. Here are some suggestions to help students overcome these challenges:

Clear Explanation of Concepts:

Provide a clear and concise explanation of the concepts of LCM and HCF. Use real-life examples to illustrate how these concepts are applied in different situations.

Visual Aids and Manipulatives:

Use visual aids such as charts, diagrams, and manipulatives to represent the concepts of LCM and HCF. For example, use prime factorization trees or Venn diagrams to visually show the steps involved.

Interactive Activities:

Incorporate interactive activities and games to make the learning process more engaging. Board games, puzzles, or online interactive exercises can help reinforce the concepts in a fun and interactive way.

Real-life Problem Solving:

Present real-life problems that require the application of LCM and HCF. Encourage students to identify the mathematical aspects of everyday situations and apply the concepts accordingly.

Peer Collaboration:

Foster a collaborative learning environment by encouraging students to work in pairs or small groups. Peer teaching and discussion can help reinforce understanding and provide different perspectives.

Step-by-Step Approach:

Break down the problem-solving process into step-by-step procedures. Emphasize the importance of each step, such as prime factorization, and guide students through the process systematically.

Use of Technology:

Integrate technology tools, such as interactive software or educational apps, that allow students to practice solving LCM and HCF problems in a digital environment. This can make learning more dynamic and appealing to tech-savvy students.

Differentiated Instruction:

Recognize and accommodate different learning styles by providing varied instructional methods. Some students may benefit from hands-on activities, while others may prefer visual or auditory explanations.

Contextualize Learning:

Relate LCM and HCF to real-world scenarios that students can easily connect with. This helps in making the concepts more relevant and shows the practical applications of these mathematical concepts.

Formative Assessment:

Use formative assessment techniques to gauge student understanding during the learning process. Provide timely feedback and address misconceptions promptly.

Encourage Questions:

Create a supportive environment where students feel comfortable asking questions. Encourage them to seek clarification on any aspect of LCM and HCF that they find challenging.

By employing a combination of these pedagogical approaches, teachers can create an inclusive and supportive learning environment that caters to the diverse needs of students, ultimately enhancing their understanding and proficiency in solving LCM and HCF problems.

By incorporating these pedagogical strategies, educators can create a more inclusive and effective learning environment for students tackling

LCM and HCF problems. Additionally, recognizing and addressing individual learning styles and needs can further enhance the success of these approaches.

2.NEED AND SIGNIFICANCE OF THE STUDY:

During the school visit many of the students have struggle in doing LCM (lowest common multiple) and HCF (highest common factor) problems. While interacting with the students, they have the problem to understand the factors and multiples concept. Hence the topic has been chosen for this action research.

3.STATEMENT OF THE PROBLEM:

Resolving the difficulties in solving LCM and HCF problems among VI standard

students

4.SAMPLE OF THE STUDY:

31 VIth standard students in GBHSS-Rayakottai in Kelamangalam block are selected as sample for this study.

5.PROBABLE CAUSES FOR THE PROBLEM:

- Have poorly developed number sense.
- Inaccurate recall of basic arithmetic facts.
- Lack of interest in solving problems.

6. DELIMITATIONS:

- This problem was limited to VI standard students

- This problem was limited to students of VI standard in GBHSS Rayakottai alone

7.OBJECTIVES OF THE STUDY:

- To resolve the difficulties of students in solving LCM and HCF problems.
- To explore the new strategies in teaching LCM and HCF problems.
- To find out the difficulties of students in solving LCM and HCF problems.

8.HYPOTHESES OF THE STUDY:

- There is no significant difference between the pre-test and post-test scores among the students in solving LCM and HCF problems.

9.DESIGN OF THE STUDY:

Present study is a single group experimental design. Pre-test will be conducted to all the students studying in VI std. Activities are framed by the Action Researcher. Treatments will be given for the students with the assistance of the Co-Researcher. Post-test will be conducted after giving the treatment to study the effect of the treatment.

10.TOOL:

A Questionnaire was prepared by the practitioner for Pre-test and Post-test. The tool consists 20 one mark questions. Questions based on teaching strategies in classroom transaction. Questionnaire was prepared in Tamil language .

11.TREATMENT:

I.Working model practice

Creating a working model activity to teach LCM (Least Common Multiple) and HCF (Highest Common Factor) can be both engaging and effective. Here's a step-by-step guide to designing and implementing a working model activity:

Activity: LCM and HCF Using Beads and Strings

Materials Needed:

1. Beads of different colors (e.g., red, blue, green)
2. String or yarn
3. Scissors
4. Markers or labels (optional)
5. Paper and markers for explanations

Procedure:

1. **Introduction (5 minutes):**
    - Start by introducing the concepts of LCM and HCF to the students, explaining their importance and relevance in mathematics.
    - Provide examples and simple explanations of LCM and HCF using numbers familiar to the students.
2. **Preparation (10 minutes):**
    - Prepare sets of beads in different colors representing numbers and their prime factors. For example, you might use red beads for 2, blue beads for 3, green beads for 5, etc.
    - Cut pieces of string or yarn of varying lengths to represent multiples of different numbers. Label or mark each string with

the corresponding number it represents (e.g., a string representing multiples of 2 would be labeled "2").

- Ensure that each set of beads and strings is easily distinguishable and organized for the activity.

3. **Modeling LCM (15 minutes):**
    - Begin with the concept of LCM. Show the students how to find the LCM of two numbers using the beads and strings.
    - Choose two relatively small numbers (e.g., 4 and 6) and demonstrate how to build the prime factorization of each number using the beads.
    - Then, use the strings to represent the multiples of each prime factor. For example, for 4, you might use a string with four red beads, and for 6, you might use a string with three blue beads.
    - Combine the strings to form a new string that includes all the prime factors of both numbers. The length of this combined string represents the LCM of the two numbers.
    - Allow students to observe and manipulate the beads and strings to understand how the LCM is determined.
4. **Modeling HCF (15 minutes):**
    - Next, move on to the concept of HCF. Show the students how to find the HCF of two numbers using the beads and strings.
    - Choose the same two numbers used for LCM (e.g., 4 and 6) and demonstrate how to build the prime factorization of each number using the beads.

- Identify the common factors shared by both numbers and represent them using the beads. Arrange the beads to show the highest common factor.
- Alternatively, use the strings to represent the common multiples of both numbers and find the shortest string, which represents the HCF.
- Again, encourage students to observe and manipulate the beads and strings to understand how the HCF is determined.

5. **Explanation and Discussion (10 minutes):**
    - After modeling both LCM and HCF, gather the students to discuss the process and results.
    - Ask probing questions to ensure understanding, such as "How did we determine the LCM/HCF using the beads and strings?" and "Why is the concept of LCM/HCF important in mathematics?"
    - Encourage students to share their observations and insights from the activity.

Benefits:

- This working model activity provides a tangible and visual representation of LCM and HCF, making the concepts more concrete and understandable for students.
- By engaging in hands-on manipulation of beads and strings, students actively participate in the learning process, fostering deeper understanding and retention of the concepts.
- The activity encourages collaboration, critical thinking, and problem-solving skills as students work together to model and analyze LCM and HCF.

By incorporating a working model activity like LCM and HCF Using Beads and Strings into mathematical teaching, educators can create a dynamic and interactive learning experience that promotes conceptual understanding and engagement.

Activity: LCM and HCF Using Manipulative Blocks

Materials Needed:

- Manipulative blocks (e.g., snap cubes, base-ten blocks, or any small blocks that can be easily manipulated)
- Workspace or table for each student or group
- Worksheet with problems involving LCM and HCF (optional)

Procedure:

1. Introduction (5 minutes):

- Begin by reviewing the concepts of LCM and HCF with the students, providing examples and explaining their importance in mathematics.

2. Preparation (10 minutes):

- Distribute manipulative blocks to each student or group.
- Explain to students that they will be using the blocks to model numbers and explore LCM and HCF visually.

3. Modeling LCM (15-20 minutes):

- Start by demonstrating how to model the LCM of two numbers using manipulative blocks.

- Choose two numbers, such as 6 and 8, and ask students to model each number using the blocks.
- Then, guide students to arrange the blocks in rows or stacks to find the least common multiple of 6 and 8.
- Encourage students to observe patterns and discuss strategies for finding the LCM using the blocks.

4. Modeling HCF (15-20 minutes):

- Next, demonstrate how to model the HCF of two numbers using manipulative blocks.
- Choose two numbers with common factors, such as 12 and 18, and ask students to model each number using the blocks.
- Then, guide students to identify the common factors between the two numbers and remove the corresponding blocks to find the highest common factor.
- Encourage students to discuss how they determined the HCF using the blocks and any patterns they noticed.

5. Independent Practice (15-20 minutes):

- Provide students with a worksheet containing problems involving LCM and HCF, or allow them to create their own problems.
- Have students work individually or in groups to model the LCM and HCF of the given numbers using manipulative blocks.
- Circulate among the students to provide support, clarify instructions, and address any questions or misconceptions.

6. Reflection and Discussion (10-15 minutes):

- Conclude the activity with a group discussion to reflect on what students have learned.
- Ask students to share their experiences, observations, and strategies for finding LCM and HCF using the manipulative blocks.
- Summarize key concepts and reinforce the importance of LCM and HCF in mathematics.

Benefits:

- This hands-on activity allows students to manipulate physical objects to visualize and understand abstract mathematical concepts.
- By using manipulative blocks, students can actively engage with the material and explore different strategies for finding LCM and HCF.
- The model provides a concrete representation of LCM and HCF, making the concepts more accessible and memorable for students.

By incorporating working model activities like LCM and HCF Using Manipulative Blocks into mathematical teaching, educators can create interactive and engaging learning experiences that promote deeper understanding and retention of key concepts.

II.ICT activity

GeoGebra is a powerful mathematical software that can be effectively used to teach concepts related to least common multiple (LCM) and highest common factor (HCF) in mathematics. Here's how you can utilize GeoGebra in teaching these concepts:

1. **Visualization of Factors**: GeoGebra allows you to create visual representations of numbers and their factors. You can use points, lines, and shapes to represent numbers and their factors, making it easier for students to understand the concept of factors and how they relate to each other.
2. **Exploring Multiples**: With GeoGebra, you can create dynamic representations of multiples of numbers. Students can manipulate sliders or input values to see how multiples change and identify patterns. This hands-on exploration helps students develop a deeper understanding of multiples and their relationship to each other.
3. **Finding Common Multiples**: GeoGebra can be used to find common multiples of two or more numbers. You can create interactive diagrams where students can input values for multiple numbers and visually identify common multiples. This helps students understand how to find common multiples systematically.
4. **Least Common Multiple (LCM)**:
    - GeoGebra can illustrate the concept of LCM by visually representing the process of finding the smallest common multiple of two or more numbers.
    - You can create interactive diagrams where students can input values for two or more numbers, and GeoGebra can dynamically calculate and display the LCM.
    - GeoGebra can also visualize the relationship between factors, multiples, and the LCM, helping students understand how the LCM is related to the factors of the numbers involved.

5. **Highest Common Factor (HCF)**:
    - Similarly, GeoGebra can be used to demonstrate the concept of HCF by visually representing the process of finding the largest common factor of two or more numbers.
    - You can create interactive diagrams where students can input values for two or more numbers, and GeoGebra can dynamically calculate and display the HCF.
    - GeoGebra can also illustrate the relationship between factors, multiples, and the HCF, helping students understand how the HCF is related to the factors of the numbers involved.
6. **Practice and Exploration**:

    GeoGebra provides opportunities for students to practice finding LCM and HCF through interactive activities and explorations. You can create dynamic worksheets or applets where students can solve problems related to LCM and HCF and receive immediate feedback.

    Overall, GeoGebra offers a versatile platform for teaching LCM and HCF, allowing students to visualize concepts, explore patterns, and engage in interactive learning activities that deepen their understanding of these fundamental mathematical concepts.

    By incorporating GeoGebra into the teaching of LCM and HCF, educators can create engaging, interactive learning experiences that promote conceptual understanding, problem-solving skills, and mathematical reasoning. GeoGebra's versatile features make it a valuable tool for exploring and mastering these fundamental concepts in mathematics.

III. Play way activity

Teaching factors through outdoor games can provide a hands-on and engaging experience for students while allowing them to connect mathematical concepts with real-world scenarios. Here's an outdoor game activity to teach factors:

Activity: Factor Scavenger Hunt

Materials Needed:

- Chalk or markers (for drawing on pavement or ground)
- Index cards or small pieces of paper
- Writing utensils

Procedure:

1. Preparation (10-15 minutes):
    - Select an outdoor area with ample space for students to move around freely, such as a playground, courtyard, or field.
    - Divide the outdoor area into several sections or stations using chalk or markers. Each station should be large enough to accommodate a small group of students.
    - On index cards or pieces of paper, write down numbers that have multiple factors. Choose a variety of numbers, including prime and composite numbers, and consider the age and skill level of the students when selecting the numbers.
2. Introduction (5 minutes):
    - Gather the students in a designated area and explain to them what factors are and how they are used in mathematics.
    - Give examples of factors and explain how they relate to multiplication and division.

3. Game Setup (5 minutes):
    - Distribute the index cards or pieces of paper with numbers written on them to the various stations around the outdoor area.
    - Explain the rules of the scavenger hunt to the students:
        - Each group will start at a different station.
        - At each station, the group will find the factors of the number written on the card and record them on a separate sheet of paper.
        - Once they have found all the factors, they will move on to the next station.
        - The first group to complete all the stations or the group with the most correct factors at the end of the time limit wins the game.
4. Scavenger Hunt (20-30 minutes):
    - Divide the students into small groups and assign each group to a different starting station.
    - Start the scavenger hunt timer and instruct the groups to begin.
    - As students move from station to station, encourage them to work together to find the factors of the numbers written on the cards.
    - Circulate among the groups to provide assistance, clarify instructions, and monitor progress.
5. Discussion (10-15 minutes):
    - After the scavenger hunt concludes, gather the students together for a group discussion.

- Review the factors that the students found for each number and discuss any misconceptions or errors that arose during the activity.
- Reinforce the concept of factors and their relationship to multiplication and division.
- Ask students to share strategies they used to find factors and discuss which numbers were easier or more challenging to factorize.

Benefits:

- This outdoor game activity provides a dynamic and active way for students to explore factors in a real-world setting.
- Students have the opportunity to collaborate with their peers, problem-solve, and apply their mathematical knowledge in a hands-on context.
- By engaging in physical activity outdoors, students may experience increased motivation and enjoyment while learning mathematical concepts.

By incorporating outdoor game activities like Factor Scavenger Hunt into mathematical teaching, educators can create memorable and meaningful learning experiences that promote student engagement and understanding.

Teaching least common multiple (LCM) and highest common factor (HCF) through play-based activities can make the learning process more engaging and enjoyable for students. Here's a fun play way activity to teach LCM and HCF, along with the procedure:

Activity: LCM and HCF Bingo

Materials Needed:

- Bingo cards (pre-made or create your own)
- Markers (such as counters or small pieces of paper)
- Number cards or flashcards with various numbers

Procedure:

1. Preparation:
    - Create Bingo cards with a grid of numbers on each card. You can use numbers ranging from 1 to 100 or adjust based on the level of your students.
    - Make number cards or flashcards with a variety of numbers that are factors or multiples of each other. Include both prime and composite numbers.
2. Introduction:
    - Begin by explaining the concepts of LCM and HCF using simple examples and visuals. Ensure that students understand the definitions and how to calculate LCM and HCF.
3. Bingo Setup:
    - Distribute Bingo cards to each student.
    - Explain that they will be playing Bingo with a twist – instead of calling out numbers, you will be calling out mathematical operations (e.g., "Find a number that is a multiple of 6").
    - Place the number cards or flashcards face down in a pile.
4. Gameplay:
    - Start the game by picking a number card from the pile and announcing the mathematical operation (e.g., "Find a number that is a multiple of 4").

- Students scan their Bingo cards to find a number that fits the announced criteria and mark it with a marker.
- Continue drawing cards and announcing operations until a student gets a row, column, or diagonal of marked numbers and shouts "Bingo!".

5. Discussion:
    - After a student gets Bingo, take a moment to review the numbers they marked on their card.
    - Ask the student to identify the LCM or HCF of the marked numbers, depending on the announced operation.
    - Discuss the strategy used by the student to identify the numbers that meet the criteria.
6. Variations:
    - To reinforce understanding, you can switch roles and have students take turns being the caller, announcing the mathematical operations.
    - Adjust the difficulty level by varying the mathematical operations or the range of numbers used on the Bingo cards.
7. Extension Activities:
    - Encourage students to create their own Bingo cards with numbers and challenge their peers to find the LCM or HCF using their cards.
    - Integrate technology by using an online Bingo generator or interactive Bingo game with LCM and HCF questions.

By incorporating play-based activities like Bingo, students can actively engage with the concepts of LCM and HCF in a fun and interactive way,

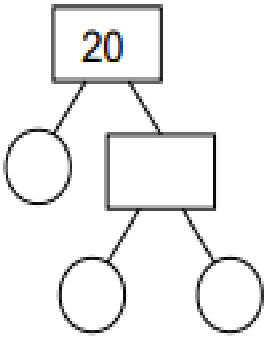
leading to better retention and understanding of these mathematical concepts.

IV. Worksheets

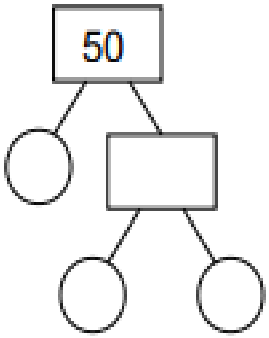
பணித்தாள்: 1

பகா காரணி படுத்துக.பகா எண்களை வட்டத்தில் எழுதவும். பகு எண்களை சதுரத்தில் எழுதவும்.

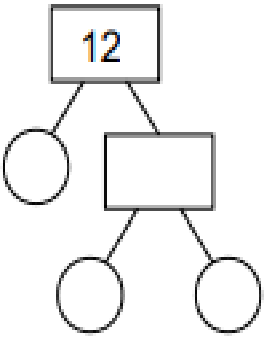
1)



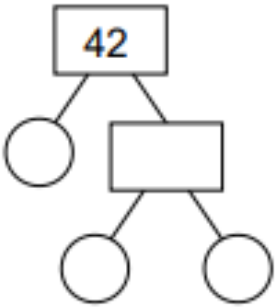
2)



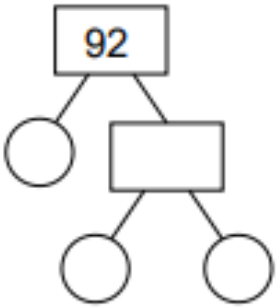
3)



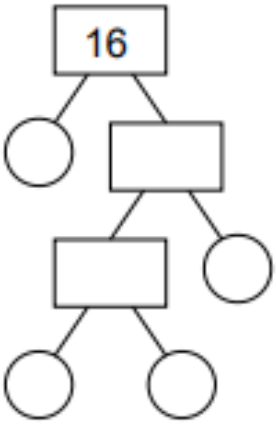
4)



5)



6)



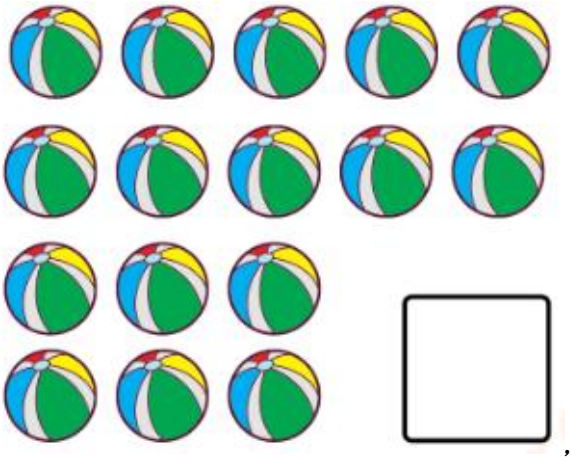
பணித்தாள்:2

1.படங்களை நன்கு உற்று நோக்கி வினாக்களுக்கு விடை அளிக்கவும்.

எத்தனை நட்சத்திரங்கள் உள்ளன?

ஒவ்வொரு நட்சத்திரங்களும் இரண்டின் மடங்குகள் எனில் நட்சத்திரங்களின் எண்ணிக்கை என்னவாக இருக்கும்?

2.

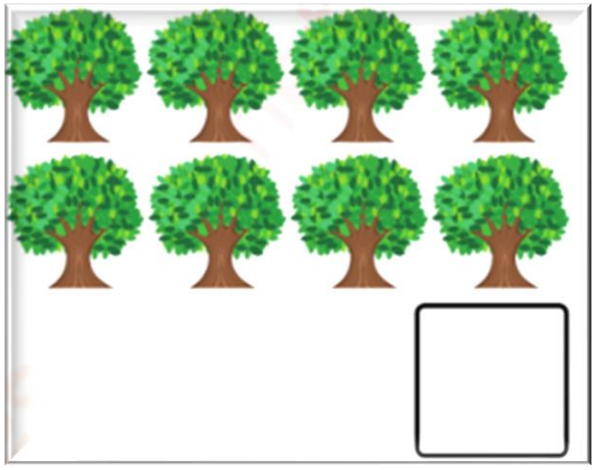


மொத்த பந்துகளின் எண்ணிக்கையை சதுரத்தில் எழுதவும்

இரண்டு இரண்டு பந்துகளாக பிரித்து வைத்தால் எத்தனை தொகுதிகளாக பிரிக்க முடியும்?

தொகுதிகளின் எண்ணிக்கைக்கும் மொத்த பந்துகளின் எண்ணிக்கைக்கும் உள்ள தொடர்பு யாது ?

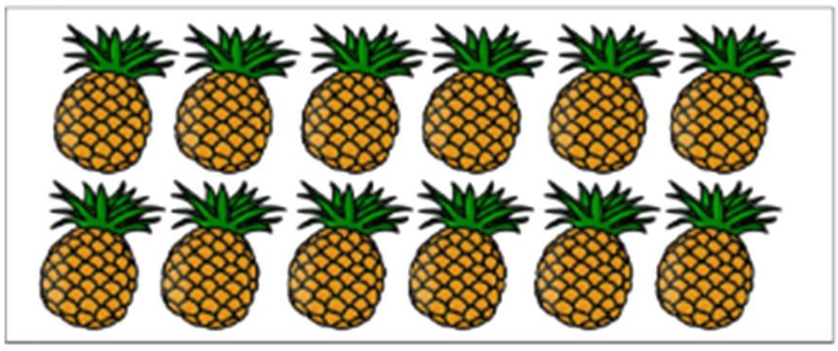
3.



மொத்த மரங்களின் எண்ணிக்கையை சதுரத்தில் எழுதவும்

ஒவ்வொரு மரத்திலும் 5 கிளிகள் தங்குமானால் மொத்தம் எத்தனை கிளிகள் இருக்கும் ?

4.



படத்தில் இருக்கும் மொத்த அன்னாசி பழங்களின் எண்ணிக்கை யாது

ஒரு நபருக்கு இரண்டு அண்ணாச்சி பழங்கள் கொடுக்க முடியும் என்றால் மொத்தம் எத்தனை நபர்களுக்கு இப் பழங்களை கொடுக்க இயலும்

5.

படத்தில் இருக்கும் மொத்த ஆரஞ்சு பழங்களின் எண்ணிக்கை காண்க

ஒவ்வொரு நபருக்கும் இரண்டு ஆரஞ்சு பழங்களை கொடுத்தால் எத்தனை நபருக்கு கொடுக்க முடியும்

ஒவ்வொரு நபருக்கும் 3 ஆரஞ்சு பழங்களை கொடுத்தால் எத்தனை நபருக்கு கொடுக்க முடியும்

ஆரஞ்சு பழங்களை மீதம் இல்லாமல் எந்தெந்த எண்ணிக்கையில் நபர்களுக்கு கொடுக்க முடியும்

பணித்தாள்:3

2,4,6,என்ற எண்களின் மடங்குகளை வெவ்வேறு வண்ணங்களில் வண்ணமிடுக. எத்தனை எண்கள் நான்கு வண்ணங்களையும் பெறுகிறது. அந்த எண்களை நாம் என்னவென்று அழைக்கலாம்.

குறிப்பு: இதேபோன்று வேறு வேறு எண்களை கொடுத்து மீச்சிறு பொது மடங்கு மீப் பெரும் பொது வகுத்தி போன்றவற்றைக் காண மாணவர்களை ஊக்குவிக்கலாம்

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

பணித்தாள்:4

கொடுக்கப்பட்டுள்ள மூன்று எண்களுக்கு மீ. சி.ம. காண்க.

1)8,17,12	2)22,8,4
3)12,36,72	4)3,37,15
5) 5,14,10	6)18,45,90
7)42,21,34	8)50,20,40
9)56,14,8	10)33,12,3

12. DATA COLLECTION :

Pre test was conducted by direct mode by visiting school. Five days treatment was given by the practitioner .After the treatment post test was conducted. Total marks are converted to 100 from 20.

13.DATA ANALYSIS:

Mean, standard deviation and 't' values were calculated to find out the effectiveness of the tretment.

Hypothesis:

- There is no significant difference between the pre-test and post-test scores among the students in solving LCM and HCF problems.

Table-13.1

Test	Sample (N)	Mean (M)	Standard deviation (S.D)	Observed 't' value	Table 't'value value	Remarks 0.05 level of significance
Pre-test	31	11.7	8.01	16.89	1.68	Significant Difference
Post-test	31	63.06	14.58			

- From the above table it is observed that the calculated 'value is greater than the table t -value.

- ❖ So Hypothesis of present study is that "There is no significant difference between pretest and post test scores among the students in solving LCM and HCF problems" is rejected.
- ❖ There is a significant difference between pretest and post test scores among the students in solving LCM and HCF problems.
- ❖ While comparing the average scores, in pretest students scored 11.7 % and in post test they scored 63.06 %

14.FINDINGS:

- ★ The intervention significantly improved students' performance in solving LCM and HCF problems, as evidenced by a substantial difference between pretest and post-test scores.
- ★ On average, students scored 11.7% in the pretest and 63.06% in the post-test, indicating a remarkable improvement.
- ★ Students demonstrated enthusiasm and receptiveness towards learning in reformed classroom environments.
- ★ The intervention not only led to a significant improvement in students' ability to solve LCM and HCF problems but also fostered a deeper understanding of the underlying concepts.
- ★ Qualitative feedback from students highlighted a newfound confidence in tackling mathematical challenges related to factors and multiples.
- ★ Observations during the intervention revealed increased engagement and participation among students, indicating a positive impact on classroom dynamics.

- ★ The incorporation of hands-on activities and technological tools facilitated a more interactive and experiential learning experience, resulting in heightened student interest and motivation.
- ★ Teachers reported enhanced efficacy in delivering lessons on LCM and HCF, attributing this to the adoption of reflective teaching practices and a better understanding of students' individual learning needs.

These findings provide comprehensive insights into the multifaceted benefits of implementing diverse teaching strategies to address challenges in mathematics education among VI standard students.

15. RECOMMENDATIONS:

- Teachers can master more reflective teaching practices in class room transaction.
- Teacher should check the pre knowledge of the students then plan the strategy
  according to students pre knowledge.
- Teachers who use pedagogical content knowledge (PCK) may develop high teacher self-efficacy beliefs, which can result in further effective teaching and learning.
- Flipped classroom definitely encourage students learning participation.
- Technology creates a good sound in teaching and learning process. Especially in mathematical teaching technology reduce students hard thinking. It gives concreate explanation.

16. CONCLUSION:

Through the implementation of innovative teaching methodologies and targeted interventions, this actin research has demonstrated significant strides in addressing the challenges faced by VI standard students in comprehending concepts related to factors and multiples, particularly in solving LCM and HCF problems. The findings underscore the importance of adopting diverse pedagogical approaches, such as hands-on activities, technology integration, and reflective teaching practices, to enhance student engagement, understanding, and performance in mathematics. Moving forward, it is imperative for educators to continue exploring and refining teaching strategies that cater to the diverse learning needs of students, thereby fostering a conducive learning environment that promotes mathematical proficiency and confidence among learners. By embracing these approaches, educators can play a pivotal role in empowering students to navigate mathematical concepts with proficiency and enthusiasm, laying a solid foundation for their academic success and lifelong learning journey

Annexure:1- pretest and post test questionnaire

மாவட்ட ஆசிரியர் கல்வி மற்றும் பயிற்சி நிறுவனம்,கிருஷ்ணகிரி.
செயலாராய்ச்சி முன் தேர்வு வினாத்தாள்

வகுப்பு:6 **பாடம்:கணிதம்** **மொத்த மதிப்பெண்: 20**

(I). கோடிட்ட இடங்களை நிரப்புக.
1 X 5= 5

1) 45 மற்றும் 75 இன் மீ.பெ.கா---------- ஆகும்.

2) இரு அடுத்தடுத்த இரட்டை எண்களின் மீ.பெ.கா ---------- ஆகும்.

3) 3 மற்றும் 9 ஆகிய எண்களின் மீ.சி.ம 9 எனில், அவற்றில் மீ.பெ.கா---------- ஆகும்.

4) 26, 39 மற்றும் 52 ஆகிய எண்களின் மீ.சி.ம ---------- ஆகும்.

5) 57 உடன்---------- என்ற சிறிய எண்ணைக் கூட்டினால், அது 2, 3, 4 மற்றும் 5 ஆல் சரியாக வகுபடும்.

(III). கொள்குறி வகை வினாக்கள்
1 X 5= 5

6). பின்வரும் இணைகளில், எவை சார்பகா எண்கள் ஆகும்?

அ) 51, 63 ஆ) 52, 91 இ) 71, 81
ஈ) 81, 99

7). 8, 9 மற்றும் 12 ஆகிய எண்களால் வகுபடும் மிகப்பெரிய 4 இலக்க எண் என்ன?

அ) 9999 ஆ) 9996 இ) 9696 ஈ) 9936

8). இரு எண்களின் மீ.பெ.கா 2 மற்றும் அவற்றின் மீ.சி.ம 154. அவ்விரு எண்களுக்கிடையே உள்ள வேறுபாடு 8 எனில், அவற்றின் கூடுதல் ----------

அ) 26 ஆ) 36 இ) 46
ஈ) 56

9). 120-ஐ மீ.சி.ம-ஆகக் கொண்ட எண்களுக்குப் பின்வரும் எந்த எண்ணானது அவற்றின் மீ.பெ.கா-ஆக இருக்க இயலாது?

அ) 60 ஆ) 40 இ) 80
ஈ) 30

10).இரு எண்களின் மீ.பெ.கா 2 மற்றும் அவற்றின் மீ.சி.ம 154. அவ்விரு எண்களுக்கிடையே உள்ள வேறுபாடு 8 எனில், அவற்றின் கூடுதல் ---------

அ) 26 ஆ) 36 இ) 46 ஈ) 56

(IV). பின் வரும் வினாக்களுக்கு விடைஅளிக்கவும்
2x5=10

11. கீழ்க்காணும் எண்களுக்குப் பகாக் காரணிப்படுத்துதல் முறையில் மீ.பெ.கா காண்க.

(i) 18, 24 ---------- 2 mark

(ii) 45, 55, 95 ---------- 3 mark

12. கீழ்க்காணும் எண்களுக்குப் பகாக் காரணிப்படுத்துதல் முறையில் மீ.சி.ம–வைக் காண்க.

(i) 6, 9 ----------2 mark

(ii) 30, 40, 60 ----------3 mark

ANNEXURE - 2

Scores of Students in pre test and post test

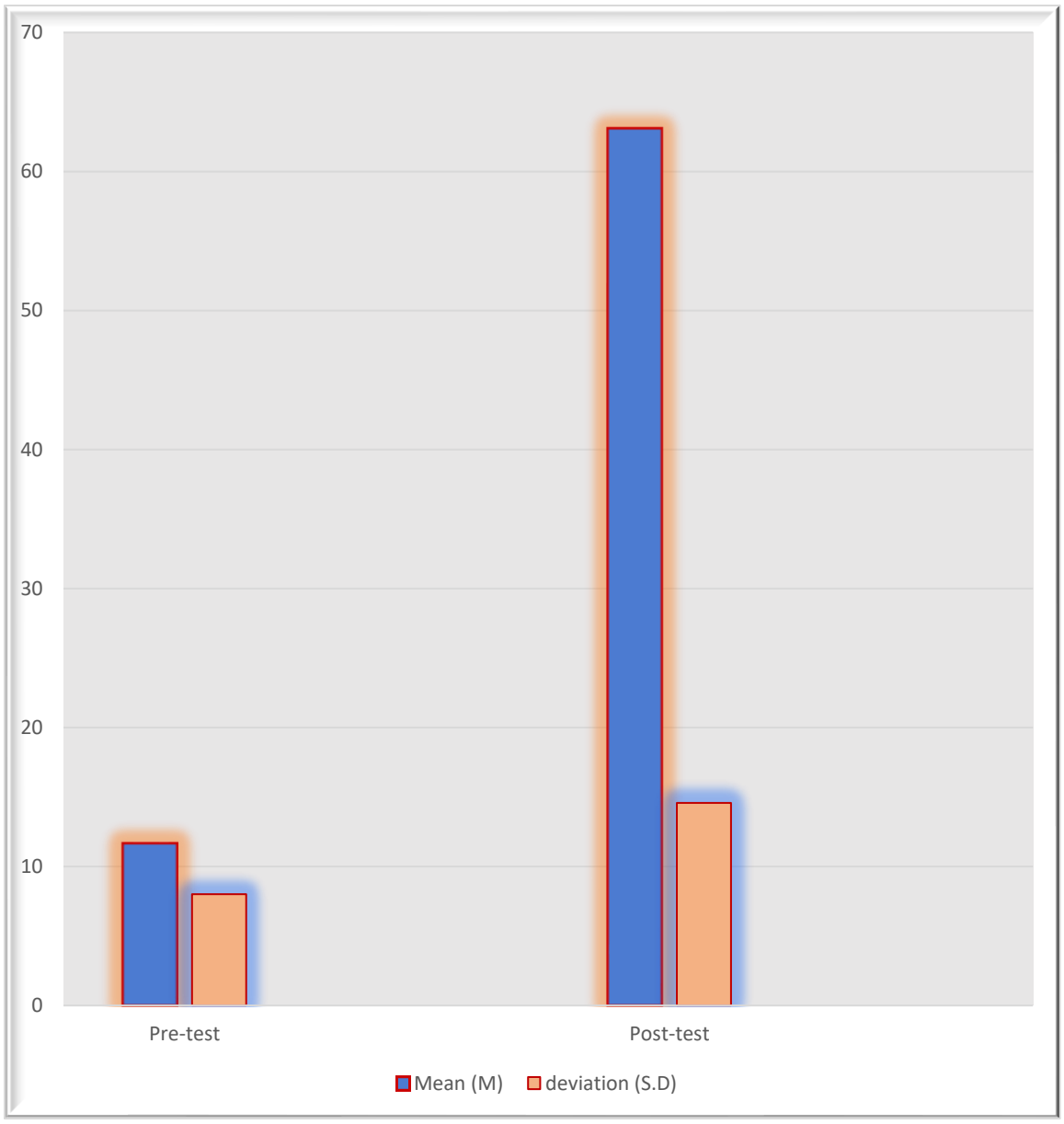
S.NO	Name	Pre test Mark 20	Converted to 100	Post test Mark 20	Converted to 100
1	Ajaya kumar.R	0	0	17	85
2	Anbarasan.M	0	0	10	50
3	Anbumani.R	2	10	13	65
4	Arish Kumar.B	2	10	9	45
5	Barath.P	1	5	12	60
6	Dhilipraj.K	5	25	17	85
7	Gowtham.B	1	5	17	85
8	Kalaiarasan.S	1	5	10	50
9	Kesavan.M	2	10	10	50
10	Kumaran.S	2	10	10	50
11	Lakshmanan.K	3	15	10	50
12	Lakshmanan.R	3	15	10	50
13	Logu.M	4	20	15	75

14	Mathimithran.M	1	5	13	65
15	Monish.T	2	10	10	50
16	Munish kumar.S	1	5	10	50
17	Nareshkumar.N	1	5	12	60
18	Pachayappan.M	2	10	17	85
19	Praveen kumar.K	1	5	10	50
20	Raman.K	4	20	10	50
21	Rohith.M	1	5	13	65
22	Sarathy.M	4	20	12	60
23	Satheesh Kumar.S	5	25	17	85
24	Tamilarasan.B	3	15	15	75
25	Thirumalai.L	2	10	12	60
26	Thirumoorty.V	0	0	12	60
27	Vinoth.M	3	15	17	85
28	Vinoth Kumar.T	5	25	15	75

29	Vishnu.M	3	15	10	50
30	Vishva.C	3	15	9	45
31	Viswesvaran.J	6	30	17	85

Annexure:3 – Chart

Comparison of mean and standard deviation of Pre test and post test



Annexure:4 – References

- Journal of Physics: Conference Series PAPER • OPEN ACCESS Teaching strategies in the learning of highest common factor and lowest common multiple To cite this article: N L A Halim et al 2017 J. Phys.: Conf. Ser. 943 012041

- Wahyu K, Amin S M and Lukito A 2017 Motivation cards to support students‟ understanding on fraction divisions International Journal on Emerging Mathematics Education 199
- Tamilnadu VI standard maths Text Book

Annexure:5 – Photos

Practitioner was conducting pre test in GBHSS Rayakottai

Practitioner was conducting activity for finding LCM and HCF using beads

Play way activity conducted by the Practitioner -factors game

ICT activity-Geogebra class conducted by Mrs.Kalaignanselvi.,Lecturer

DIET –Krishnagiri

LCM and HCF finding activity using beads

Classroom practice by peer group leaders