



“Teaching Fractions in Primary School: A Comprehensive Approach”

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PREPARATORY

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Abstract : This paper explores the methods and strategies used in teaching fractions to primary school students. It addresses the foundational understanding of fractions, misconceptions that arise during learning, and the importance of teaching fractions in a way that connects with real-life situations. The paper also reviews various pedagogical techniques, materials, and classroom activities to enhance students' understanding of fractions.

I. INTRODUCTION

When it comes to teaching fractions for kids at school or at home, it's a topic that children will probably struggle with most. The teaching of fractions is a crucial part which laying the groundwork for more advanced mathematical concepts. Teaching fractions is a deep process that requires a methodical and sequential process. While fractions are an essential skill in everyday life, they are often perceived as one of the most challenging topics for primary students. This paper reviews various methods to teach fractions effectively and presents strategies to overcome common difficulties encountered by primary school students.

II. THE IMPORTANCE OF TEACHING FRACTIONS

- **2.1 Conceptual Understanding:** Understanding fractions is critical for problem-solving in future mathematical concepts such as ratios, percentages, and decimals.
- **2.2 Practical Application:** Fractions are not just an abstract concept; they are used in real-life situations like dividing food, measuring ingredients, or dividing time.
- **2.3 Cognitive Development:** Learning fractions helps develop logical thinking and spatial reasoning.

III. KEY CHALLENGES IN TEACHING FRACTIONS

- **3.1 Fraction as a Part of a Whole:** Understanding fractions as parts of a whole is often confusing for primary students.
- **3.2 Misconceptions and Difficulties:**
 - Viewing fractions as whole numbers (e.g., thinking that $\frac{1}{2}$ is bigger than $\frac{1}{3}$).
 - Misunderstanding the relationship between the numerator and denominator.
 - Confusion about equivalent fractions.
- **3.3 Visualizing Fractions:** Many students struggle with visualizing fractions, especially when fractions are represented in different forms (e.g., pictorial vs. numerical).



representing $\frac{3}{5}$ or $\frac{2}{5}$ or both.

IV. EFFECTIVE PEDAGOGICAL APPROACHES FOR TEACHING FRACTIONS

- **4.1 Concrete to Abstract Learning:**

- Begin with concrete objects (e.g., pizza slices, blocks, or real-life materials) before progressing to abstract representations (e.g., numbers, symbols).
- Hands-on activities where students divide objects into equal parts help solidify the concept of fractions.

- **4.2 Using Visual Aids and Manipulatives:**

- **Fraction Circles and Bars:** These visual aids help in comparing fractions and understanding parts of a whole.
- **Number Lines:** Number lines are useful for understanding the relative sizes of different fractions.



- **4.3 Interactive Games and Technology:**

- Digital tools and math games (such as interactive fraction software) can engage students and allow them to explore fractions in a fun and interactive way.
- Gamification promotes understanding by rewarding correct answers and allowing trial and error.
- Exit ticket : digital exit tickets utilizing technology platforms for online quizzes. Examples of these include Twitter, Socrative, Kahoot and Plickers

- **4.4 Brain storming:**

- Brainstorming is an effective approach to teaching fractions because it fosters active engagement, critical thinking, and a deeper understanding of the concept through peer interaction. (Different ways to represent fractions or solve fraction problems, different methods like finding common factors while doing addition and subtraction of unlike fractions, real-life example of using fractions in cooking, which could help their classmates to better understand the practical application of fractions.) Website: <https://www.brainincamp.com>

V. Classroom Activities and Strategies

- **5.1 Storytelling and Word Problems:**

- Use stories involving fractions to connect mathematical concepts to real-life situations. For example, “If you have a chocolate bar and share it with 4 friends, how much will each person get?”

- **5.2 Group Work and Peer Learning:**

- Collaborative activities where students work in small groups can help reinforce understanding and allow for peer-to-peer explanations.



- **5.3 Real-Life Contexts:**

- Relating fractions to everyday life situations (e.g., cooking recipes, sharing, measuring, The incorporation of money and time into fraction.) makes the concept more meaningful and practical for students.



- **5.4 Step-by-Step Problem Solving:**

- Breaking down problems into simple steps and guiding students through logical reasoning enhances their problem-solving skills.

- **5.5 Mathematical Laboratory :,**

- Hands-on-tools from math lab develops observation, logical power, scientific attitude and mathematical skills among the students.
- The Lab Fraction Circle is a hands-on and interactive tool that can help students to visualize and understand mathematical concepts in a concrete and engaging way. It can also be used to demonstrate and reinforce mathematical concepts, and can provide students with a deeper understanding of mathematical relationships.
- Hands-on-tools helps primary students to understand how is whole divided into fractions and how different fractions are combined to get whole, to understand equivalent fractions and how to convert fraction to decimals and percentage and vice versa.



- **5.6 Co-Operative learning :**

- Co-operative learning is a successful teaching strategy in fraction use effective grouping to enhance learning. It develop the critical thinking skills of students as well as fostering a welcoming and collaborative environment.



VI. Assessment and Evaluation

- **6.1 Formative Assessment:** Frequent, informal assessments such as quizzes, oral explanations, and classroom observations help track student progress. Formative assessment also include activity base task i.e Performance-based tasks enable students to demonstrate their knowledge in a more authentic setting than the traditional paper-and-pencil exams.



- **6.2 Summative Assessment:** Periodic tests and assignments can assess overall understanding. However, practical tasks should also be included in the assessments to see how students apply their knowledge in real-life contexts.
- **6.3 Peer and Self-Assessment:** Encouraging students to assess their own understanding or to provide feedback to peers enhances reflection and deeper learning.



VII. Common Misconceptions and How to Address Them

- **7.1 Fraction Size Confusion:** Students often misjudge the size of fractions, thinking that the larger denominator means a larger fraction. Teachers can use visual aids like fraction bars or number lines to correct this misconception.

- **7.2 Equivalence:** Students may have difficulty understanding that fractions like $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent. Use manipulatives to show equivalence by physically dividing objects into different parts.
- **7.3 Addition and Subtraction of Fractions:** Students may struggle with adding or subtracting fractions with different denominators. Demonstrating the need for a common denominator through visual aids can clear this up.
- **7.4 Multiplication and Division of Fractions :** The students may able to solve the ‘part-to-whole’ problems with more ease than the ‘whole-to-part’ problems. Part-to-whole problems involve multiplication, while whole-to-part problems involved division. Research has shown that students understanding of division is more problematic than that of multiplication and without a strong understanding of division with whole numbers, students will struggle to understand the division of fractions.

Conclusion

Teaching fractions in primary school lays the foundation for many essential mathematical concepts and real-life applications. By utilizing concrete materials, visual aids, interactive activities, and addressing common misconceptions early on, teachers can help primary school students grasp the concept of fractions more effectively. With consistent practice and innovative teaching methods, students can build a solid understanding of fractions, which will serve them well in their mathematical journey. Integrating AI-driven tools in the classroom can offer students a more tailored and engaging learning experience, addressing their unique needs and challenges. Furthermore, some gamification processes teachers use inside the school environment will soon become even more standard as a teaching and assessment tool. Experience shows that games and numerous digital tools are successfully used in schools for gamification

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