



## 'Line-Stop' method- A boon for the Children with Autism Spectrum Disorder to improve the basic arithmetic operations

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### Abstract

Basic arithmetic operations are important in our day to day life. 'Line-Stop' method makes the children with Autism to do more effective and can make them easy understanding of simple addition and subtraction. Fifty children with Autism Spectrum Disorder were taken in the Experimental Study at Tiruppur District and the investigator got a good result and felt satisfied. In this article, the strategy which is used here is simple and can be taught easily by teachers, special educators and parents.' Line' and 'stop' comments are frequently used and played an important role here. If the teacher teaches this method very perfectly, the child can do the basic arithmetic operations without assistance.

**Key words:** Arithmetic operations, Autism, Mathematics, Line-Stop method, Teaching strategy, Counting

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### Introduction

Learning is common for all. Everyone can learn in this world each and every day. Unfortunately present days our knowledge is identified by the papers of certificates. However we get certification in our life is fully experienced by practices. For that, all the students sometimes written in paper and get qualified. Even normal children struggle to overcome these academic milestones. We should think about the special children. They're

children who have a disability or a combination of disabilities that makes learning or other activities difficult. Especially children with Autism Spectrum Disorder have good rote memory but they have difficulty in doing basic arithmetic operations. The investigator tried to simplify and modify to do arithmetic operations by 'Line-Stop' method..

### Review of literature

The researcher reviewed seventeen most popular and basic mathematical

researches and those studies do not mention or find out to do independent counting in mathematics for children with Autism Spectrum Disorder. For the confirming the Reviews, the investigator discusses few of them here.

According to Ahmet yikmis (2016), three male children with the age of 8 to 10 years. were taken for the study. The touch math technique in teaching basic addition to children with Autism was explained. This method is very useful to the children when they use gadgets only. The Authors Mohd et al., (2020) found out the game based learning for the children with Autism of age 5 to 8 years at primary level and this method also useful and not done by manually like normal children. The research of May et al., (2015) took 32 boys and 32 girls of 7 to 12 years for the one-year follow-up study and he successfully taught the basic literacy and numeracy in children with Autism Spectrum Disorder. By applying Experimental method, the Author Triwahyuningtyas et al., (2020) taught the fraction to the four students with Autism, Specific Learning Disability, Intellectual Disability at fourth grade school level. Pre – requisite math skills of counting was experimentally done by David.F Cithak and Joangrim (2008). Their study fully concentrated on the strategies to enhance independent purchase skills of children with Autism Spectrum Disorder

and Moderate Intellectual Disability. According to the investigators Jo Adkins & Sue Larkay (2013), the children with ASD and Developmental Delay were categorized into three thinkers namely visual thinkers, music mathematics thinkers and verbal logical thinkers. He encouraged the children with ASD and Developmental Delay to do mathematics practically.

### **Need for the Study**

The investigator had come across the children with special needs who have difficulties in basic arithmetic calculations like addition, subtraction and multiplication. Investigator reviewed 17 articles. Few articles started from counting, some articles gave importance to concept development and three articles mentioned teaching strategy for children with special needs. But no article mentions how to do counting independently. Hence the Author found a special method 'Line-Stop' method to overcome these difficulties

### **Research Questions**

- How can overcome the difficulties?
- What are the simple methods to teach basic arithmetic functions?
- To whom these methods applicable?
- Is any research done already in this field?
- Is the research suitable for children with Autism?



Do the children with Autism can do the basic arithmetic operations without assistance?

### Objectives

# To reduce the arithmetic difficulties in the field of mathematics.

# To teach basic arithmetic operations through line-stop method for children with Autism Spectrum Disorder.

# To make the learning environment easy for the children with Autism Spectrum Disorder

### Methodology

Locale of the Study - Tiruppur District, Tamil Nadu, India.

Selection of Sample - Autism Spectrum Disorder (Mild)

- Age 5 to 9 years
- Girls and Boys

Sample size - 50

Sampling Technique – Purposive

Sampling

Criteria for sample selection:

Inclusion Criteria

i) Special schools and Inclusive schools

ii) Children with Mild Degree of Autism Spectrum Disorder

iii) Children who knew numbers from zero to ten and are able to follow instructions

iv) Children who are regular to school

Exclusion Criteria

i) Other Disabilities

ii) Children who are not responding and showing a higher level of behavior issues

Methodology consists of the following four steps

(i) Counting (ii) Number line (iii)

Addition (iv) Subtraction

### (i) COUNTING

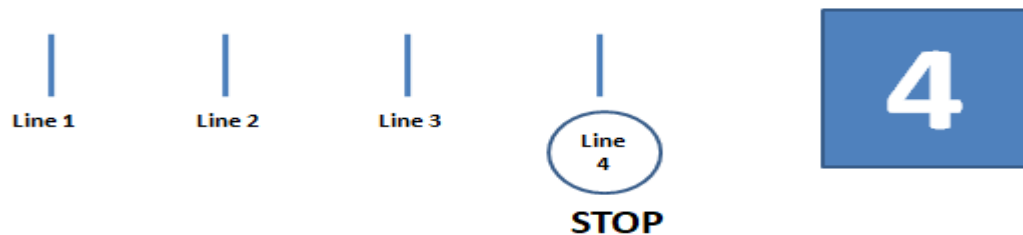
Mostly children with Autism do not stop when they count. For that counting itself, we say the comment 'STOP' for the final object or picture.

The Following examples 1 and 2 were given for understanding the concept of counting without assistance.

### Example 1 : Picture counting



### Example 2 : Line Counting

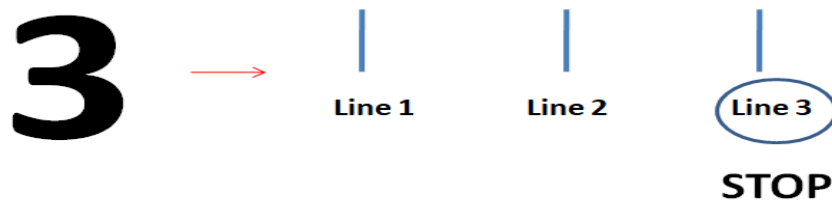


The child is trained to write numbers below each and every picture in sequence order respectively. At the final picture, write the number and circle it. While circling the final picture/line, the child should say the comment 'STOP'. This is the indication to the child to stop when the picture/line is over. We should train with pictures first and then lines. As counting concept itself, the child can understand 'STOP' comment. Then move to draw lines for respective numbers.

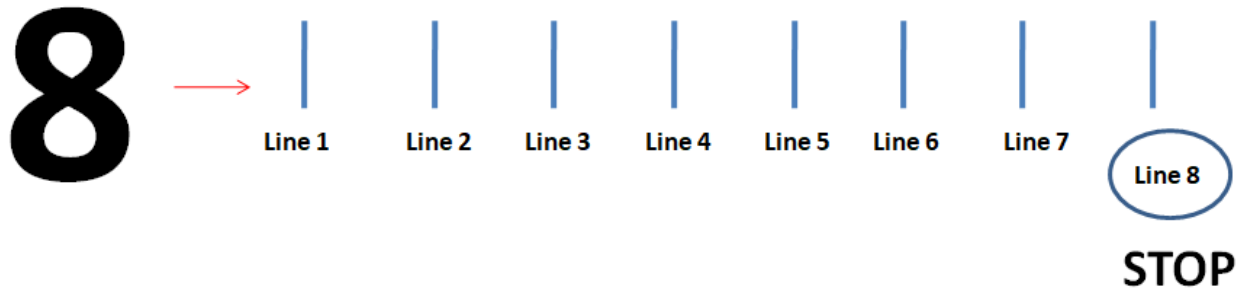
#### (ii) Number line

Suppose the given number is three 3, child should say and draw line one, line two, line three, stop and circle it. In the beginning the children is confused between line and one. i.e. If the child put line below he/she writes two. We know that " Practice makes perfect" so continuous training gives good result. The Following examples number 3 and 4 were given for understanding the concept of 'Number line'

#### Example 3:



**Example 4:**



This is the line stop method. Once 'counting and number line' concept is attained, pass to single digit addition.

**(iii) Addition**

When we teach addition starting itself we must train the sign\symbol of addition. For that just trace the symbol 2 or 3 times and say addition, then we should count. Addition means count and then teaches vertical addition alone, because children will be confused to do horizontal method at the beginning.

STEP 1: Trace and say addition, say addition means "COUNT".

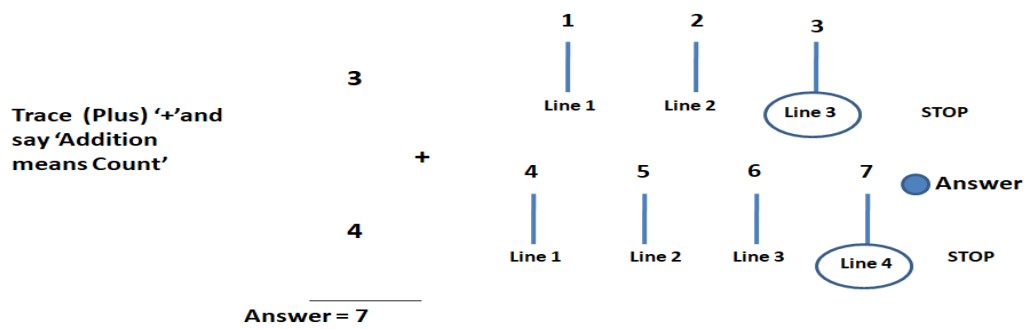
STEP 2: Draw number line for each number in the right side then use line stop method.

STEP 3: Ask the child to write number above the line, when he/she counts continuously. (Put dot and say answer)

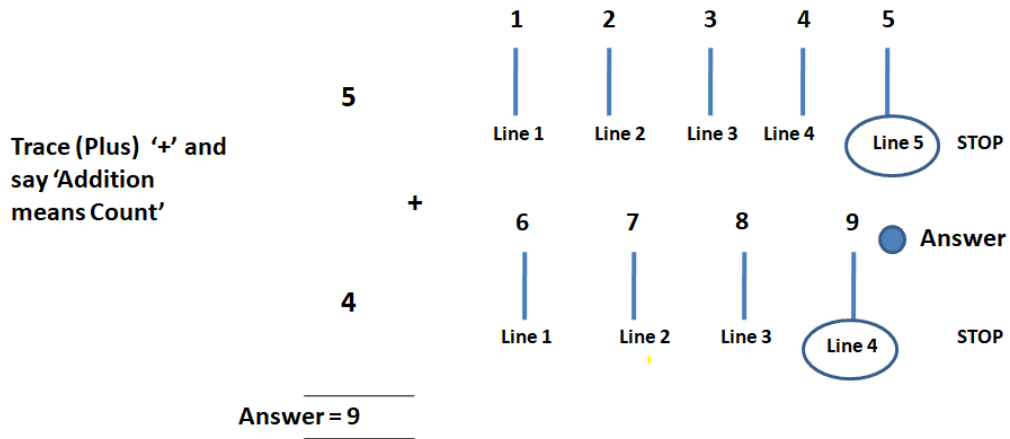
STEP 4: Write the Answer

The Following examples number 5 and 6 were given for understanding the concept of Single Digit Addition.

**Example 5:**



**Example 6:**



**(iv) Subtraction**

In subtraction also, we should train symbol to the children. Trace and say MINUS means strike out (say 2 or 3 times). Vertical subtraction only is taken for the study. As we have done in addition, same method is followed here.

STEP 1: Trace and say MINUS. Minus means 'STRIKE OUT'

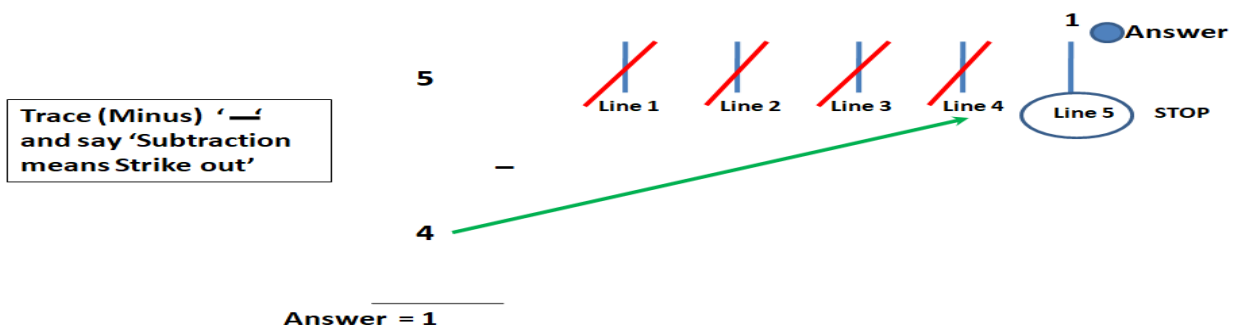
STEP 2: Draw number line for the given number in the right side. Use 'LINE-STOP' method

STEP 3: Ask the child to match number which wants to strike out. Match and strike out. Child should write number above the line which is remaining. Put dot and say answer.

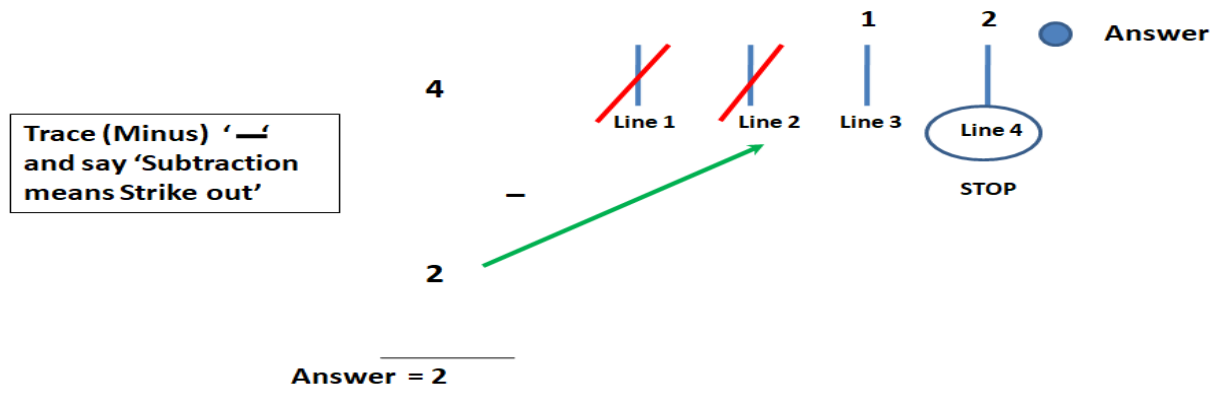
STEP 4: Write the answer.

The Following examples number 7 and 8 were given for understanding the concept of Single Digit Subtraction

**Example 7:**



**Example 8:**



In this article, examples are done for single digit only. It can be applicable for more than one digit also. It will be published in upcoming article.

**Result and Discussion**

The Researcher taught 'LINE-STOP' method to fifty students. Investigator gave five sums before and after intervention to test the efficiency of 'Line-Stop' method. After testing the Children with Autism, they got good scores in basic arithmetic operations when compared with before intervention. The test was simply checked to analyze the efficiency of 'Line-Stop' method. Hence the author wrote this article because not only her students get benefit from this method but also all the students from this world should be get benefited. The results of the data are given in Table1. This Table shows a significant difference between pretest and post test. Among fifty students twelve were girls and remaining thirty eight are boys. To check the efficiency of 'Line – Stop' method, 't' test is used to analyze the results of the students before intervention and after intervention by using SPSS.

**Table-1 Efficiency of 'Line –Stop' Method before intervention and after intervention**

Test	N	f	Mean	Standard Deviation	Significant
Pre-test	50	9	7.08	8.16373	0.000
Post-test	50		14.8	6.86012	



### Merits

- a. Easily understandable
- b. Can do sums Independently
- c. It is the foundation for further mathematical calculations
- d. It can be useful for special children as well as normal children.

### Demerits

- a. Speed Mathematics is difficult
- b. Visually challenged people could not use this method.

### Conclusion

This teaching strategy is very useful for teachers and special educators. Fundamental arithmetic operations play an important role in the academic area of the children. However Government gives concessions like calculators for writing mathematics examinations, every child should know the basic operations. So all the teachers and special educators can use this method and make the learning environment of the special children to be effective.

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