

Syracuse University

## SURFACE at Syracuse University

---

International Programs

International Programs

---

Summer 2020

### Patterns, an Approach to Learning Algebra and Developing Mathematical Thinking in Primary School in Honduras

Johana Elizabeth Thomas Zapata

Alejandra Cáceres

Follow this and additional works at: <https://surface.syr.edu/eli>



Part of the [Curriculum and Instruction Commons](#), [Elementary Education Commons](#), [Elementary Education and Teaching Commons](#), and the [Science and Mathematics Education Commons](#)

The views expressed in these works are entirely those of their authors and do not represent the views of the Fulbright Program, the U.S. Department of State, or any of its partner organizations.

---

#### Recommended Citation

Thomas Zapata, Johana Elizabeth and Cáceres, Alejandra, "Patterns, an Approach to Learning Algebra and Developing Mathematical Thinking in Primary School in Honduras" (2020). *International Programs*. 122.

<https://surface.syr.edu/eli/122>

This Poster is brought to you for free and open access by the International Programs at SURFACE at Syracuse University. It has been accepted for inclusion in International Programs by an authorized administrator of SURFACE at Syracuse University. For more information, please contact [surface@syr.edu](mailto:surface@syr.edu).

# Patterns, an approach to learning algebra and developing mathematical thinking in primary school in Honduras

Thomas, Johana, Francisco Morazán National Pedagogical University of Honduras; Cáceres, Alejandra, Francisco Morazán National Pedagogical University of Honduras.

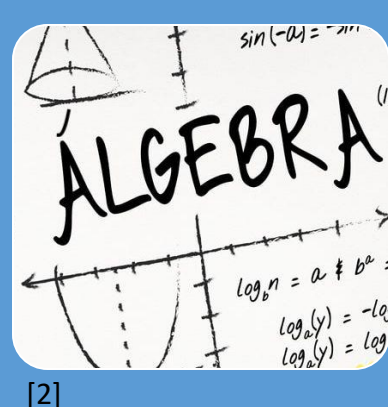
## Introduction

An essential science for the human being is mathematics. It strengthens the capacity for generalization and abstraction and it's taught since early childhood. The importance of mathematics lies in the fact that it is a universal language. Therefore, this research will look at the benefits to teach patterns at an early age to learn algebra and develop mathematical thinking. There are relevant areas in mathematics which include counting techniques, logical reasoning, algorithms, probabilities, networks, and patterns. This research will focus on showing that the learning pattern process in elementary school develops mathematical learning and improves performance in algebra in Honduran children.

## Honduran Education



[9] The National Academic Performance Report presented by the Ministry of Education of Honduras in 2017 mentions that the standards in math education are decreasing as the school grade increases .

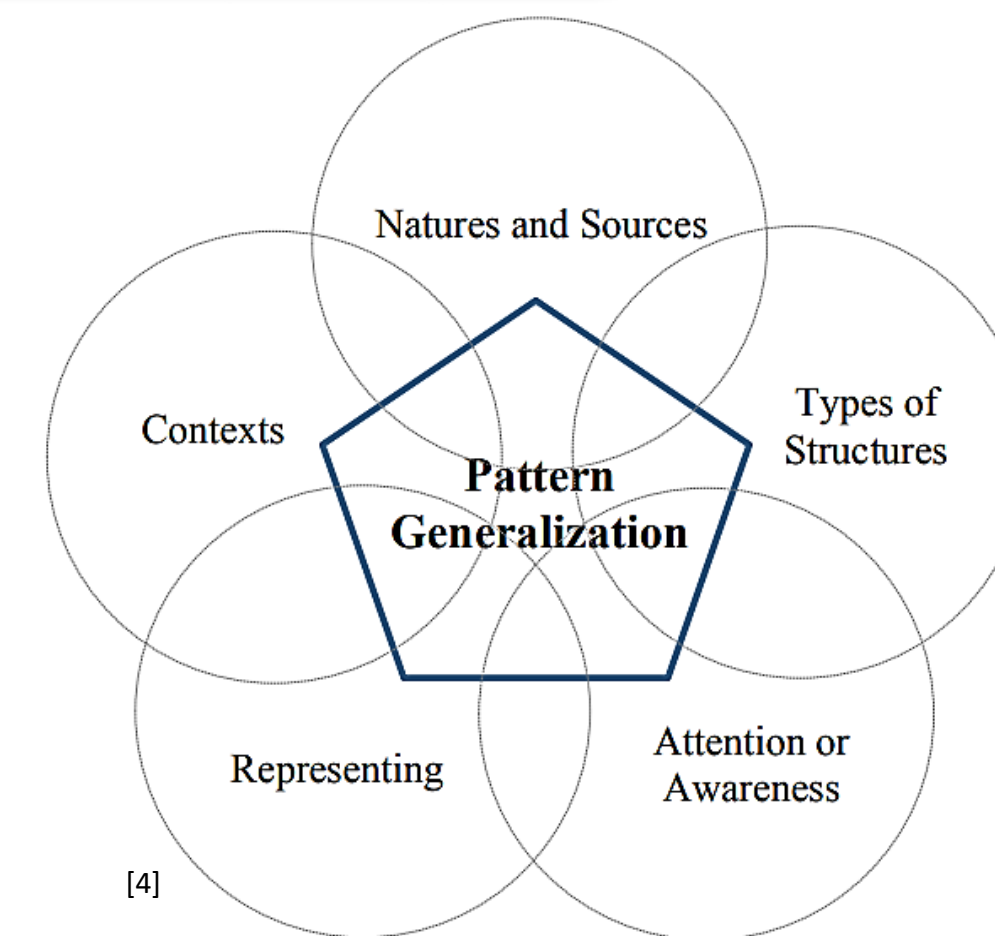


[9] From the contents related to algebra that are taught in 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> grade, none exceeds 39% of correct answers.



[8] In Honduras, all topics related to algebra are taught from seventh grade; however, other international curricula proposed that algebra should be promoted from an early age, even from preschool.

## Generalizing patterns



## Generalizing Answers

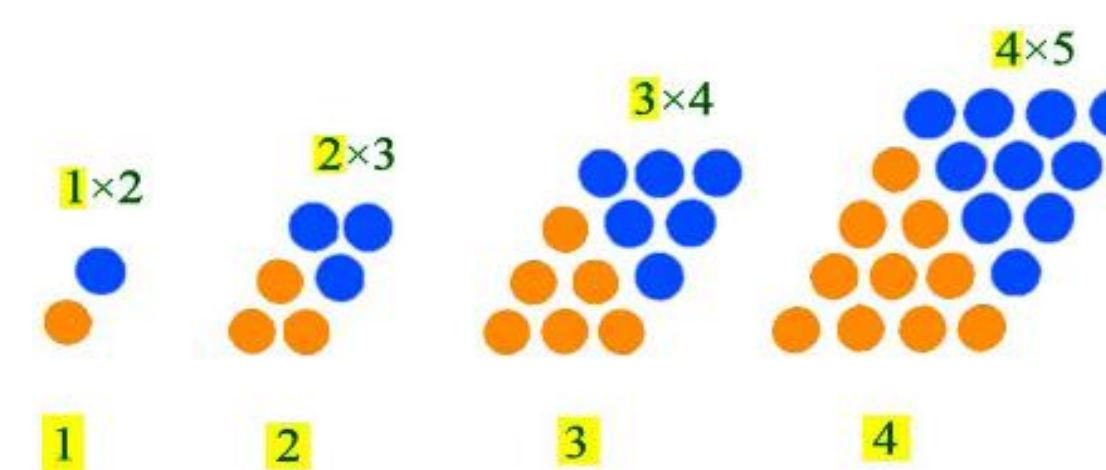
- Finding a rule that generalizes a pattern is a type of generalization.
- One of the most powerful ways to tie repeating patterns to algebra is to number the terms as you would for growing patterns.
- Then ask children questions to guide their thinking about patterns in a more general way.

For example:

Term 1	Term 2	Term 3							
Term	1	2	3	4	5	...	G		
Number of tiles	8	10	12	14				N	

- What shape is the ninth term? The twelfth term?

## Examples



## Solutions

1. Provide students with verbal and graphical representations of patterns.
2. Teach the technique of generalization of patterns.

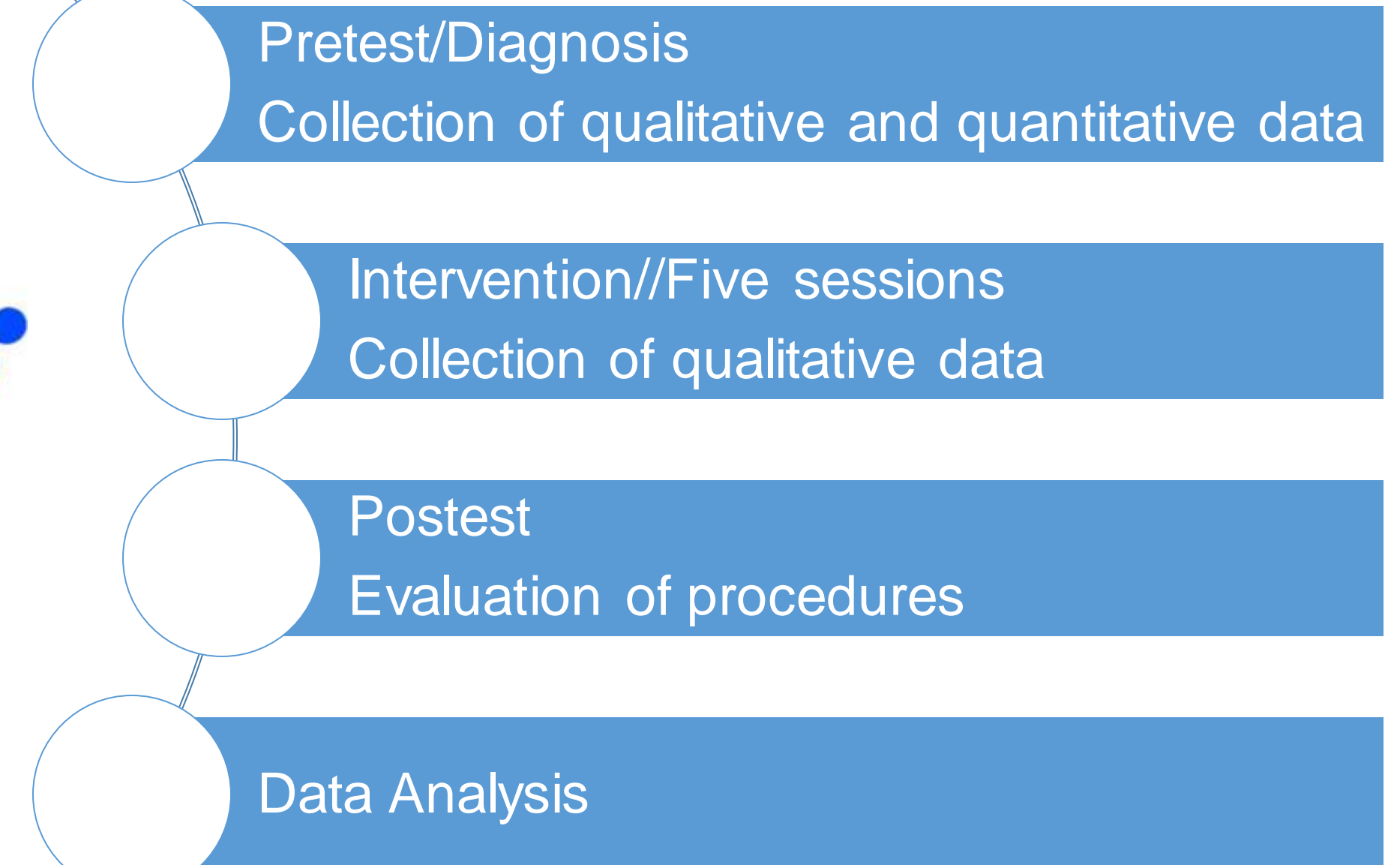


3. Develop pedagogical strategies to identify patterns in different contexts and situations. .



4. Adapt the national curricula so that patterns can be taught in elementary school as an introduction to algebra.

## Proposed Methodology



## References

[1] <https://images.app.goo.gl/ros1Y1EckkECBqP9>  
 [2] <https://images.app.goo.gl/EjWsmCCXPYixM4P6>  
 [3] <https://images.app.goo.gl/o8G48fmvUHBcVJC7>  
 [4] Rivera, F. (2015). The distributed nature of pattern generalization. PNA, 9(3), 165-191.  
 [5] <https://images.app.goo.gl/EwCeoPgUWTZJHfB9>  
 [6] <https://images.app.goo.gl/oxvyRPGt2bFY9Z19>  
 [7] <https://images.app.goo.gl/UKxxxXeK94hxZLMJ6>  
 [8] National Council of Teachers of Mathematics (2000). Principles and Standards for School Mathematics. Recuperado de: [https://www.nctm.org/uploadedFiles/Standards\\_and\\_Positions/PSSM\\_ExecutiveSummary.pdf](https://www.nctm.org/uploadedFiles/Standards_and_Positions/PSSM_ExecutiveSummary.pdf)  
 [9] Secretaría de Educación de Honduras. (2017). Informe Nacional de Desempeño Académico Español y Matemáticas. 1ro a 9no grado.  
 [10] <https://images.app.goo.gl/1EpsPe1aYYw7RBJE9>  
 [11] <https://images.app.goo.gl/1QTUPuePL9XGww4C8>