

Conceptualizing Guided Play in the Wesleyan Preschool Math Games

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INTRODUCTION

Early numeracy skills predict later academic achievement, but many students enter Kindergarten unprepared:

- Preschool is integral to the development of numeracy skills
- Math content is rarely taught in preschool classrooms

Guided play has proven to be an effective method to teach preschool children and is associated with positive academic outcome¹.

What is Play?

Play is child-led, fun, flexible, requires active child engagement and does not have extrinsic goals¹.

What is Guided Play?

The **adult initiates the learning process**, constrains the **learning goals** and helps **maintain the focus** on those goals as the **child directs their own play**²

Guided play is a vast terrain. Through designing experimental conditions for the Wesleyan Preschool Math Games RCT efficacy trial, we aim to differentiate high and low guidance conditions and make tangible the guidance mode within each game's instructions.

PARTICIPANTS AND METHODS

Experimental Conditions:

High Guidance Teacher	Low Guidance Teacher
High Guidance Math Ambassador	Low Guidance Math Ambassador

Participants:

- 50 Preschool Classrooms from throughout Connecticut

MATH GAMES DESIGN PRINCIPLES

- Games were designed by Wesleyan students over 10 years through an iterative process
- They were designed to inherently promote early numeracy
- The games are based on cognitive development research^{3,4}
- The games were tested in preschool classrooms and refined through feedback and observation

EXPERIMENTAL CONDITION DESIGN

Guided play operates on a continuum between free play and direct instruction. Higher guidance is correlated with increased adult activity and increased adult control over the child⁵

Both high and low guidance conditions could be advantageous for teaching early numeracy skills and are supported by the literature but...

- Low guidance provides a space for promoting child exploration and curiosity
- High guidance emphasizes the deliberate teaching of skills.

EXPERIMENTAL CONDITION PRINCIPLES

What is High Guidance?

- Adult initiates play
- Adult provides scaffolding by directing children to play with materials in certain ways
- Adult provides explicit guidance towards the mathematical goals of the games through directive questions
- Adult given ways to adapt the games to different levels of knowledge

What is Low Guidance?

- Child initiates play and adult supports it
- Not one correct way to play with the materials
- Math content only introduced if child's play provides opportunity for it
- Adult asks non-directive questions
- Adults given open-ended suggestions for how the materials could be used

REFERENCES

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MATH GAME INSTRUCTION

High Guidance

Math Garage

Explain that each board is a parking lot and that the player(s) need to park their cars in the **spot that matches**.

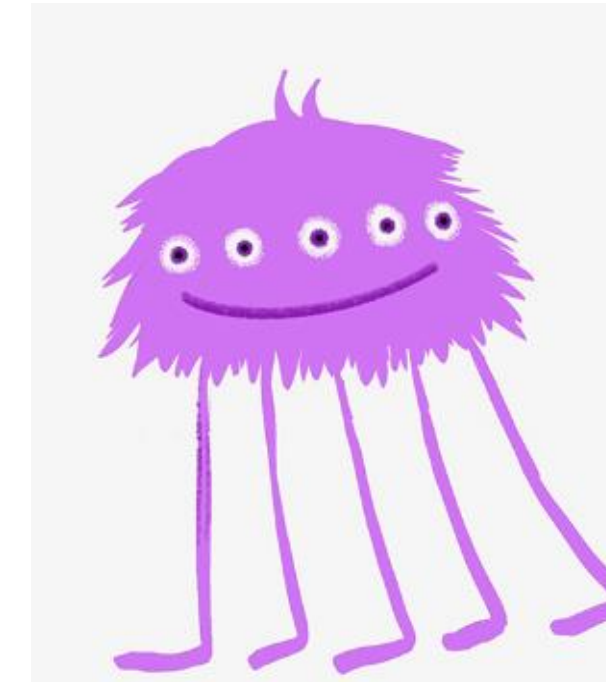


Low Guidance

The players could park the cars in numerical order, match the cars' numbers to the number of dots on the parking spaces, or **do anything else they can think of!**

Monster Math

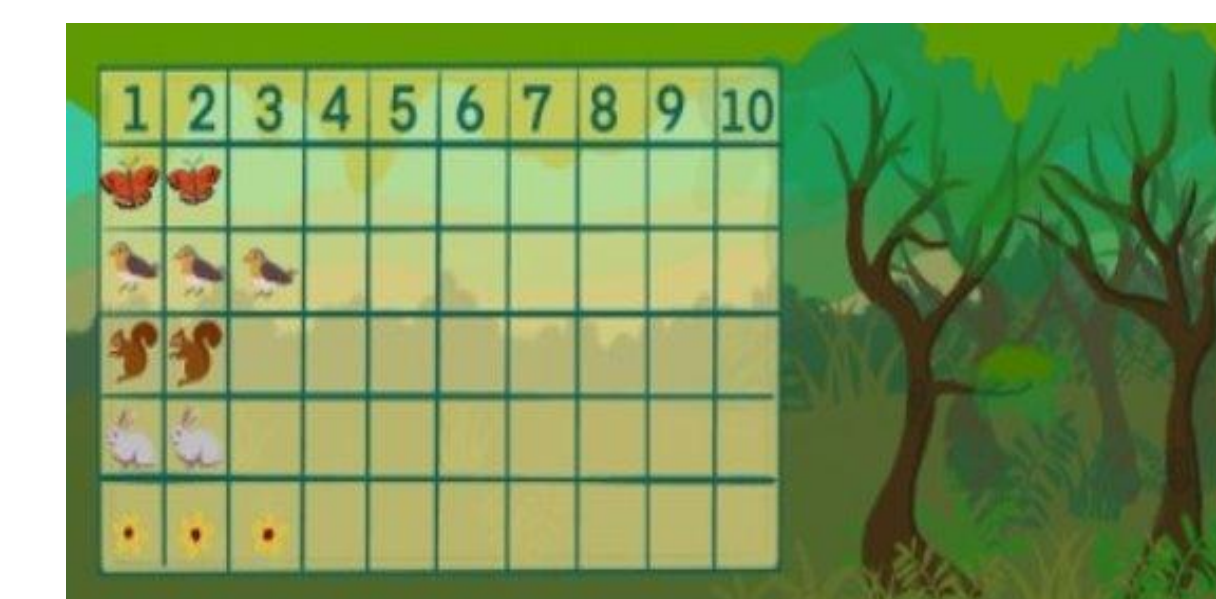
The goal of the game is to **help the players understand the relationship between the number of legs and the number of shoes needed** and to problem solve on how to match the sets.



The goal of the game is to allow the players to **reason by themselves** to get "enough" shoes for the monster.

Forest Friends

Explain that the players need to **use the grid to decide how many animals live in their forests!** Have each player roll the dice to determine the number of each forest friend!



Players can use the grid to count out how many animals will go in the forest OR they can **decorate first and count the animals after**.