



**A SUMMARY**

The LEGO Foundation

# NEUROSCIENCE & LEARNING THROUGH PLAY

A review of the evidence



# Contents

Introduction • 3

Joyful • 4

Meaningful • 4

Actively engaging • 4

Iterative • 5

Socially interactive • 5

Closing thoughts • 5

**This summary of our white paper presents the five characteristics of playful learning experiences and their links to findings in neuroscience.**



Medial view of the brain

## Introduction

The brain is a dynamic and elastic organ that must be exercised properly in order to develop. Learning through play can happen everywhere providing opportunities for holistic brain development. Each of the five characteristics of playful experiences is associated with exercising the neural networks involved in brain processes, including reward, memory, cognitive flexibility, and stress regulation, that are activated during learning. In addition to helping children learn more effectively and holistically, this primes children's brains for future development and creating pathways for further learning.

# Characteristics of playful experiences

## Joyful

- Emotions allow us to respond appropriately to our environment, assess our decision-making and prime the brain for further learning.
- Joy is one of the most powerful emotions when it comes to learning because it's a motivator linked to enhanced memory, attention, mental shifting and creativity. It has also been linked to improved stress regulation.

## Meaningful

- Meaningful experiences provide opportunities for progress in learning. In moving from effortful to automatic processing, learning thrives in mindsets supported by meaningful experiences such as contextual learning, analogical reasoning and motivation.
- Meaningful experiences make it easier to retain knowledge and also provide a springboard for further learning by stimulating the brain's networks for analogical thinking, memory, insight, reward and motivation.

## Actively engaging

- Active engagement in play requires attention and response, which are helpful in developing higher cognitive processes beneficial to learning, such as goal-directed behaviour, reward, temporal awareness, long-term memory retrieval, and stress regulation.
- Being active participants in learning affords children greater agency, which acts as a catalyst for them to seek more information and take more action. It sets off a cycle of positive reinforcement, invoking feelings of confidence, progress and positive affect that lead to more agency improvisation and is strongly linked to imagination and problem-solving.

For more information see our full white paper 'Neuroscience and learning through Play: A Review of the Evidence'

- Read about research studies behind learning through play
- See our recommended future research areas

## Iterative

- Repetition of activity or thought enables new discoveries with each round of experiences. Iteration is critical to lifelong learning, as it is required for experimentation and improvisation and is strongly linked to imagination and problem-solving.
- Iteration requires and develops important characteristics such as perseverance, rational judgement, flexible thinking and creativity.
- Practice with iteration strengthens our ability to iterate further.

## Socially interactive

- Human interactions from birth help build the neural foundations for communication, interpreting social cues, developing healthy social emotional regulation and protection from learning barriers such as stress.
- Peer interactions help children develop language and skills such as cooperation and adaptability, and exercises the brain processes that help us interpret and understand others' perspectives.

## Closing thoughts

The different regions of our brains develop in connection with each other, not in isolation. The five characteristics of playful learning described above each play a distinct role in helping to activate and facilitate this process. Enabling children to have joyful experiences, to find meaning in what they are doing or learning, to engage actively, to practice iterative thinking and to interact socially can provide them with the foundations for lifelong learning.





LEGO Fonden  
Højmarksvej 8  
DK-7190 Billund

CVR number: 12 45 83 39

LEGO is trademark of the LEGO Group  
©2019 The LEGO Group

[www.LEGOfoundation.com](http://www.LEGOfoundation.com)

The LEGO Foundation