

Designing therapeutic customizable games for children with Cerebral Palsy



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Design challenge

Design a set of **games** that will help in
physiotherapy of **children** with
cerebral palsy

Design challenge

Therapeutic yet fun games

Adaptable to each child's needs

Minimize compensation

Ease of use

CP: our focus

Upper extremities hemiplegia

Hand movements

Mainly fine motor skills

Menu for therapists

Adaptivity

CP: our focus



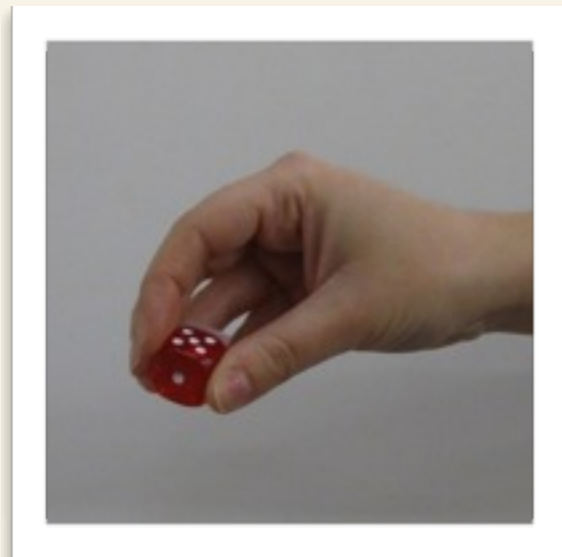
Gross grasps



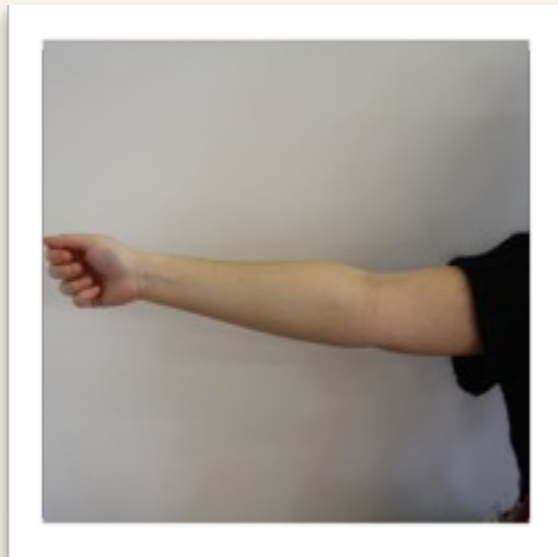
Arm supination



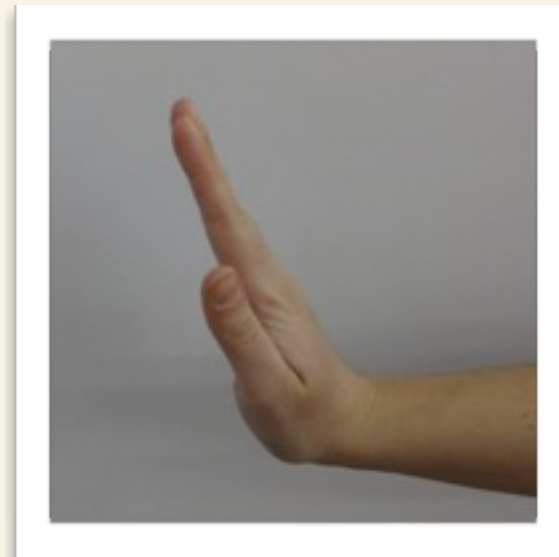
Finger extension



Fine grasps



Shoulder extension



Wrist extension

Technology

TagTiles

Interactive board

RFID

Lights and sounds

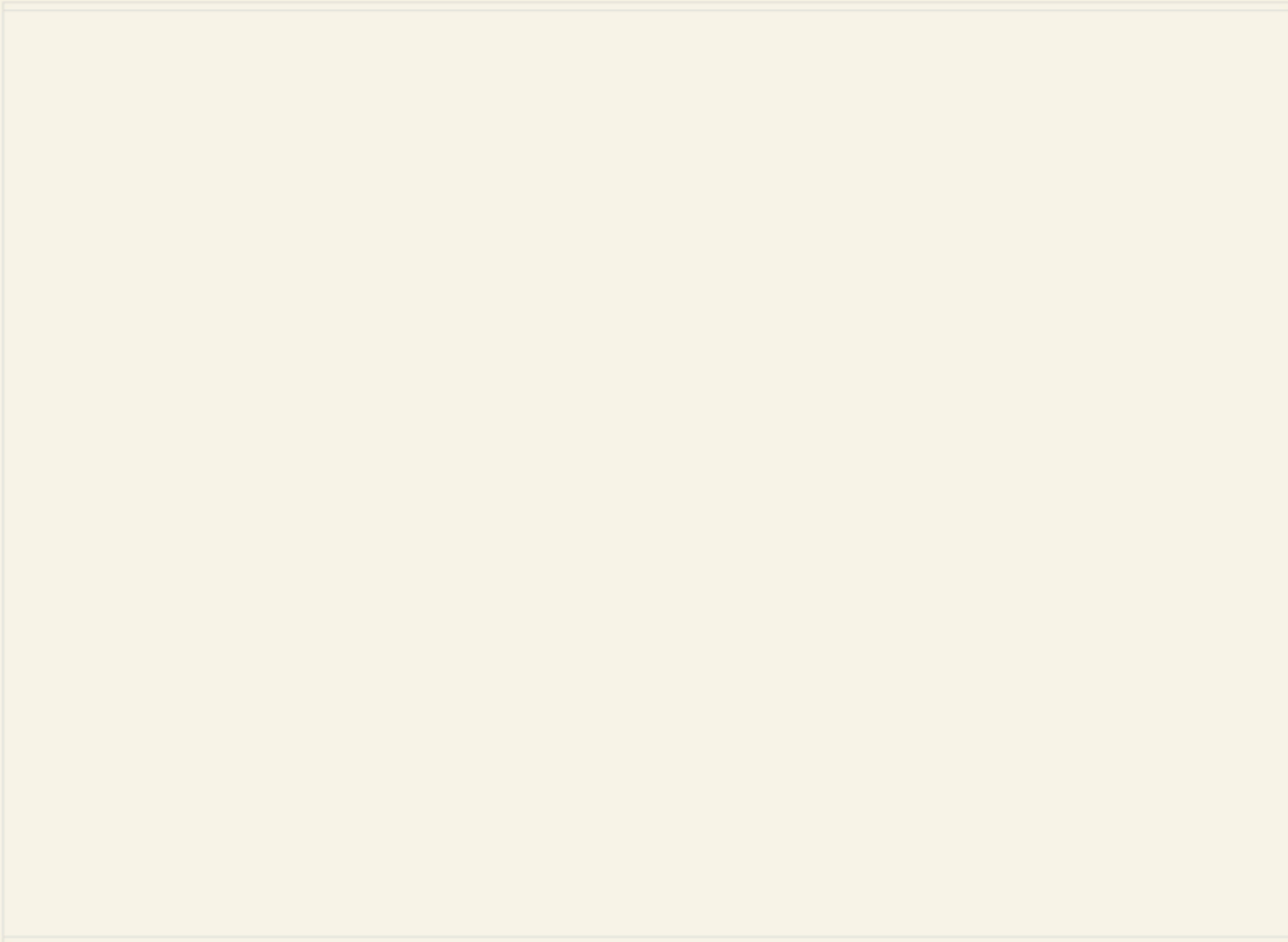
Prototype

Computer bound



Design cycle

Client Centered Approach
Iterative - 3 Cycles



Design challenge Technology Design cycle The prototype Discussion Future possibilities

1



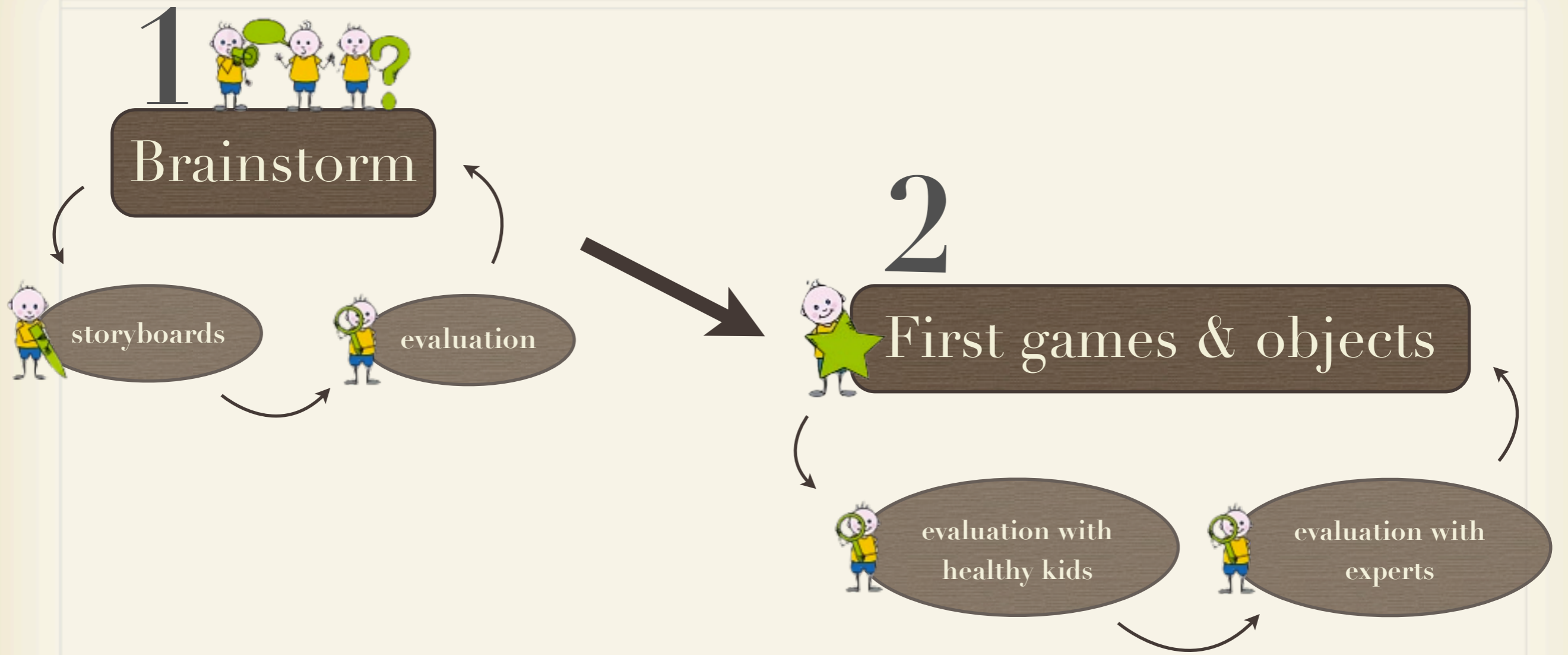
Brainstorm



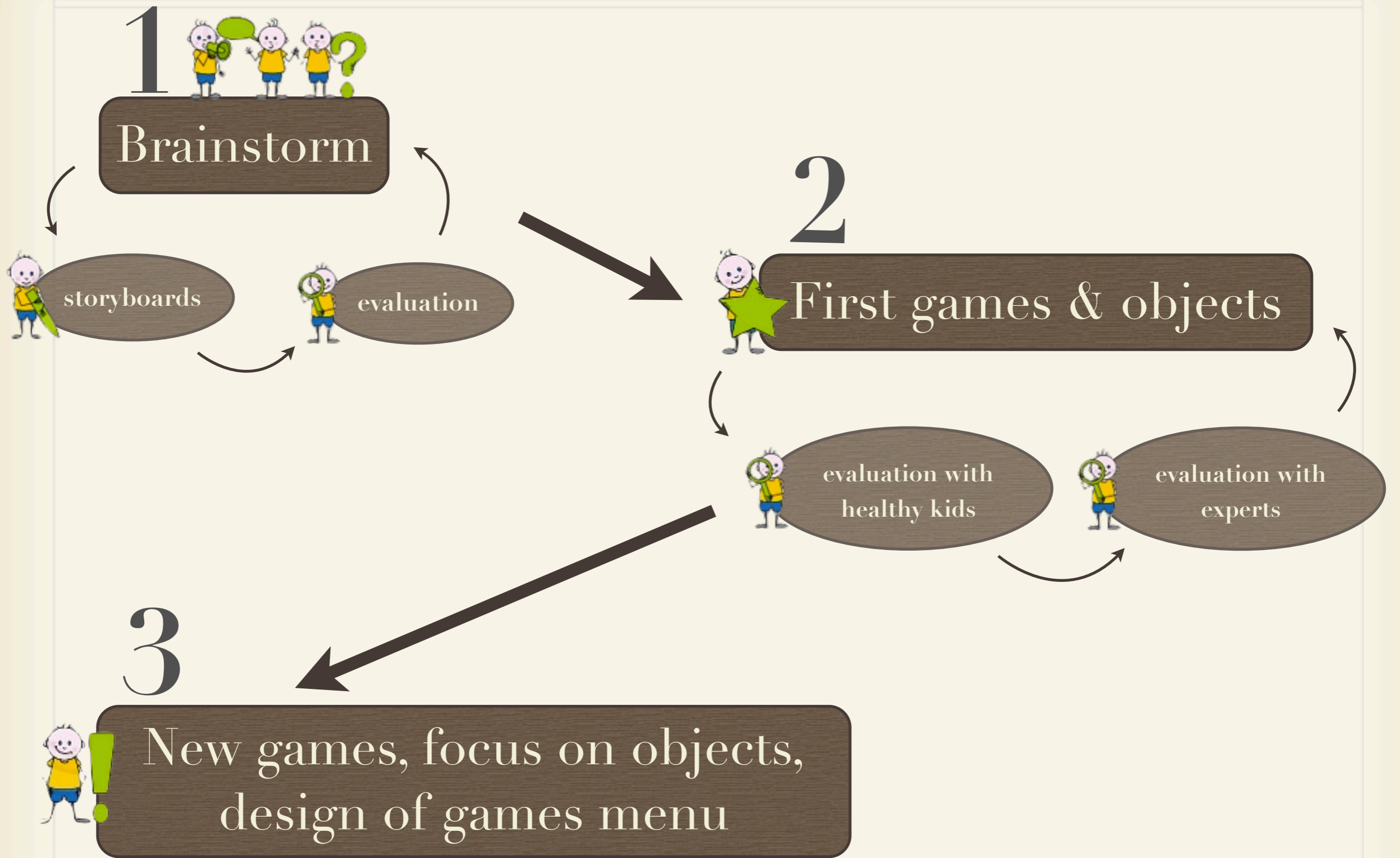
storyboards

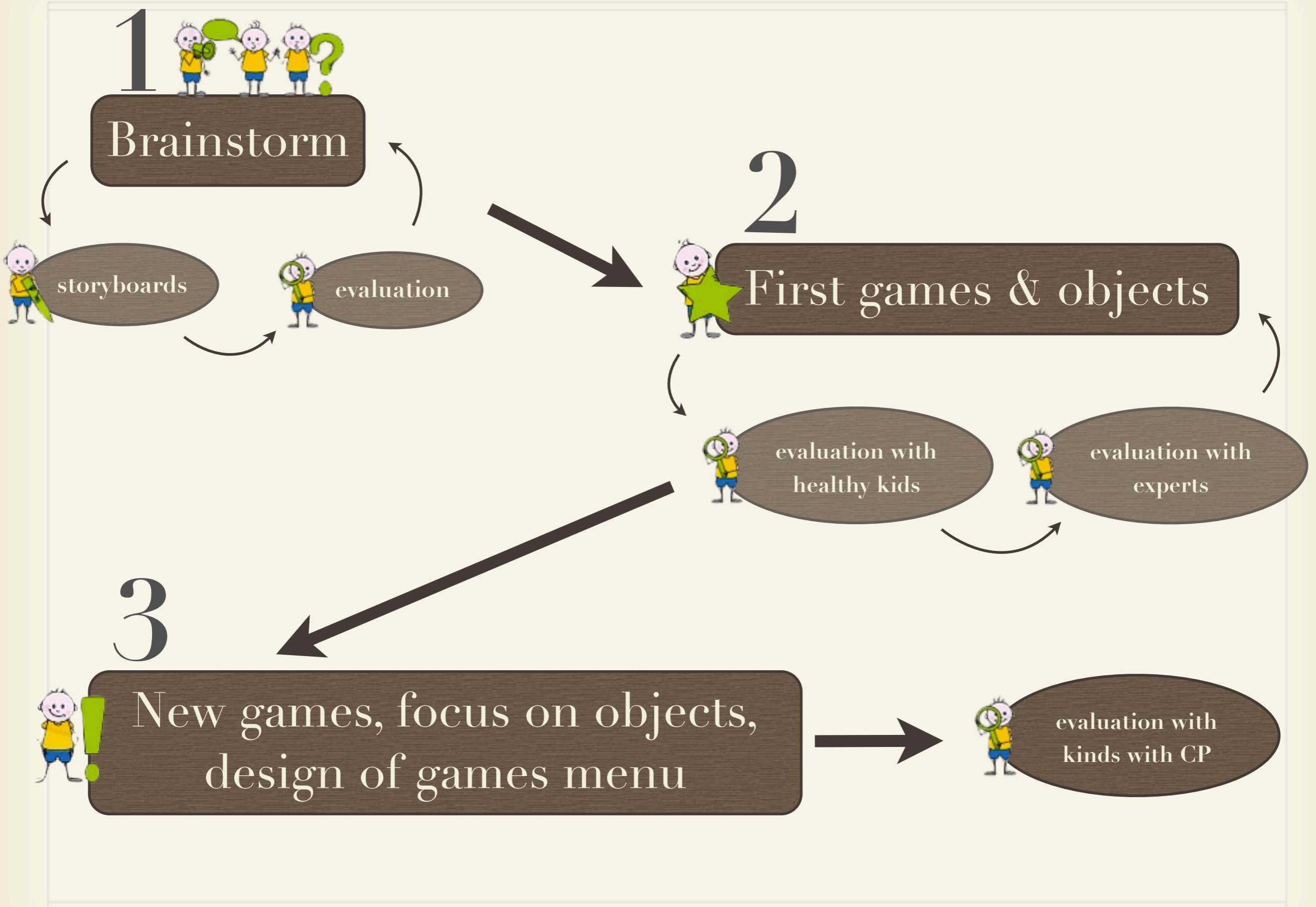


evaluation



Design challenge Technology Design cycle The prototype Discussion Future possibilities





Design challenge Technology Design cycle The prototype Discussion Future possibilities

The games



5 games for different movements

Multiple objects

Menu for therapists

The hungry monster



Trains grasps

Squares light up

Eat them with the
monster

Multiple objects

Play the drum



Trains supination

Blue & Yellow
squares

Catch them with
palm or back of
your hand

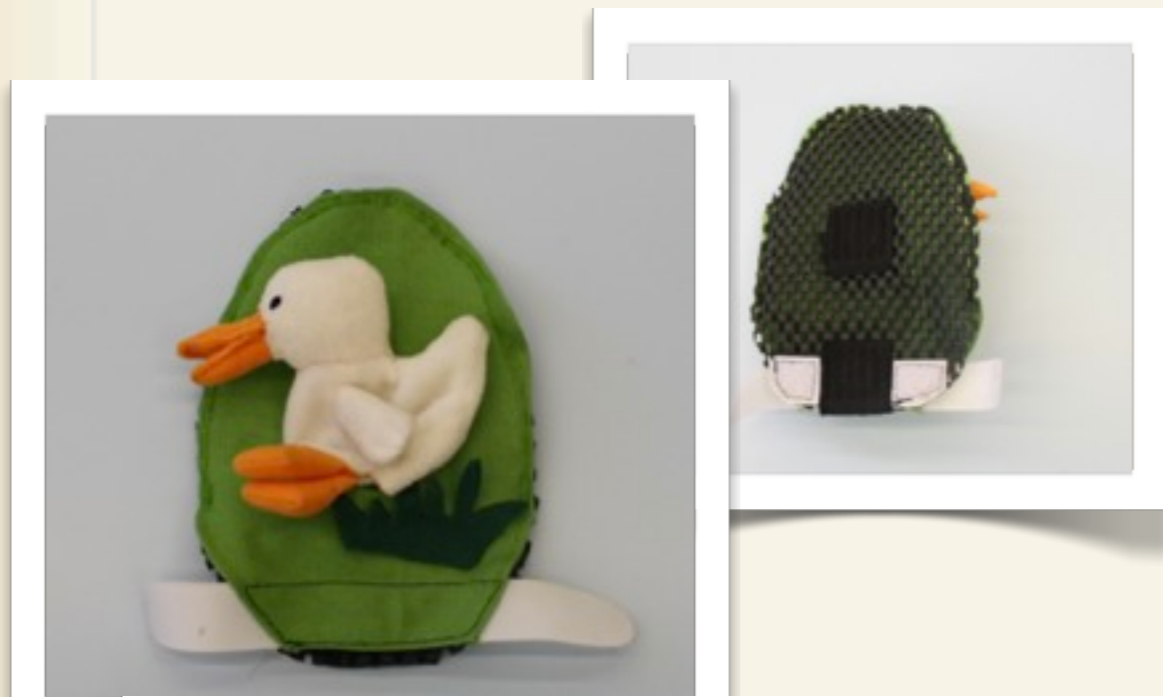
Piano twister



Trains finger extension
Touch two squares
simultaneously to play
piano



Catch the flies



Trains wrist extension

Catch flies appearing on the screen

Two tags - base of the hand & on the fingers



Catch the raindrops

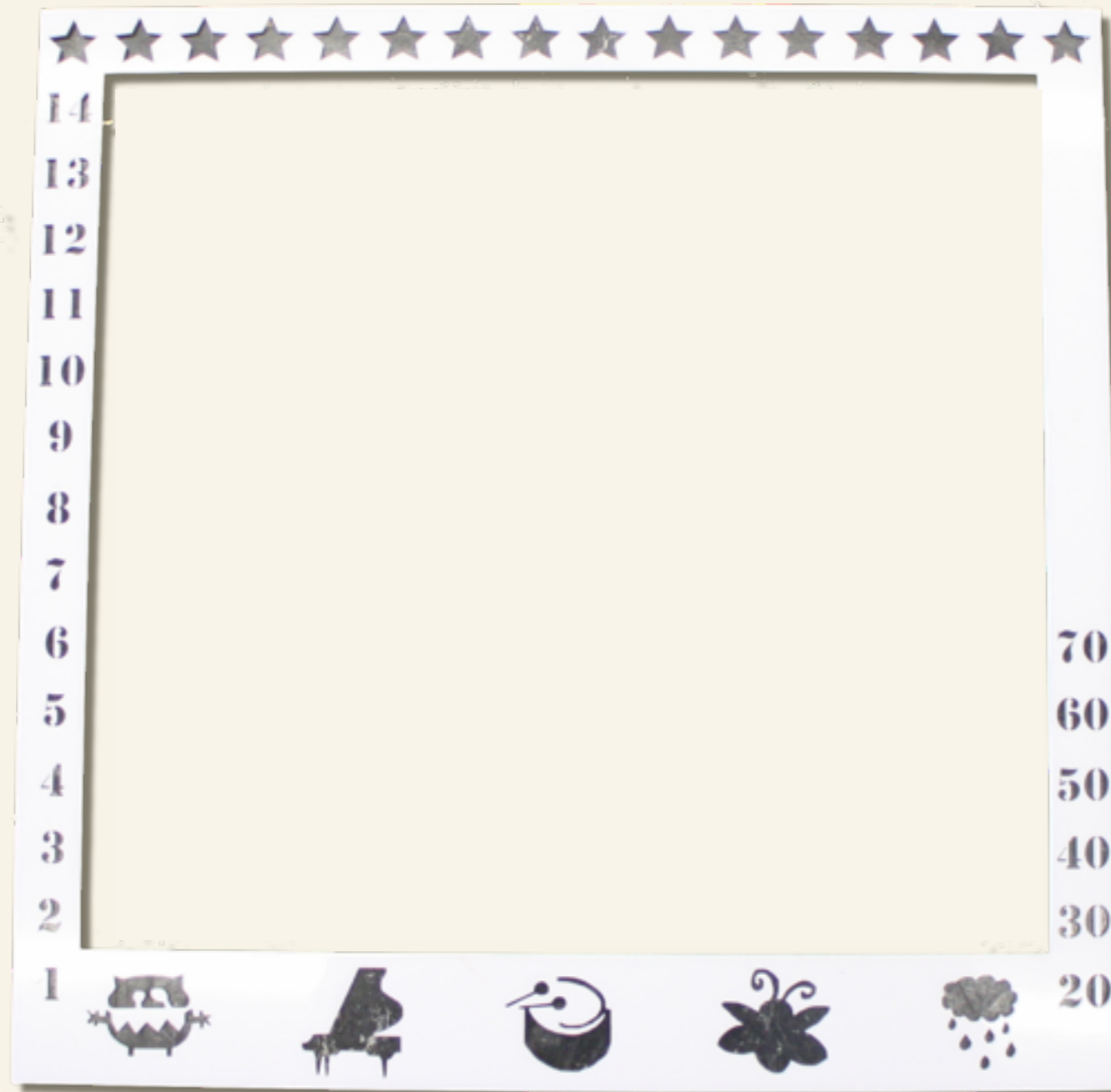


Trains shoulder
extension

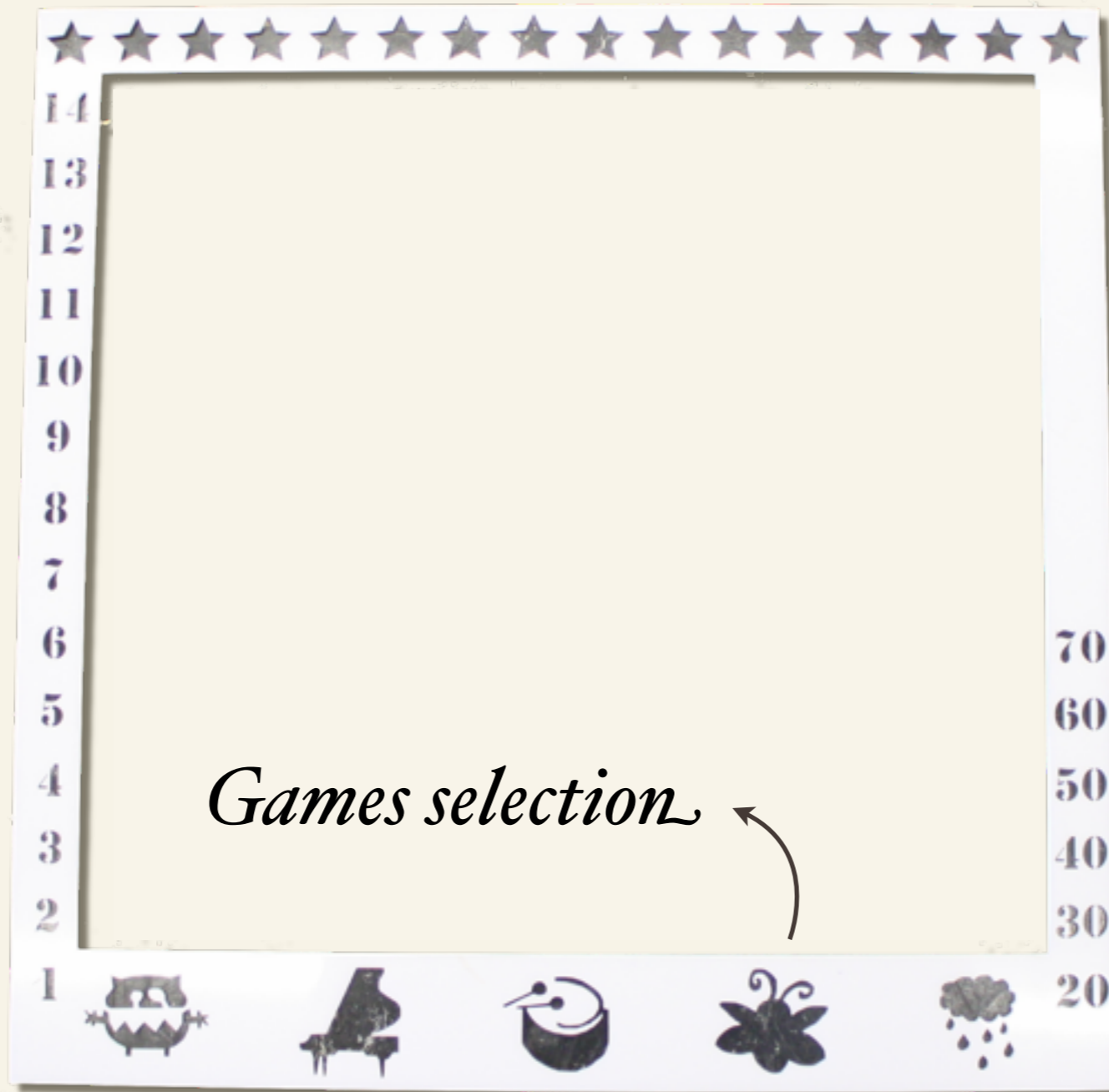
Catch blue raindrops
falling from top to
bottom of the board

Board in vertical
position

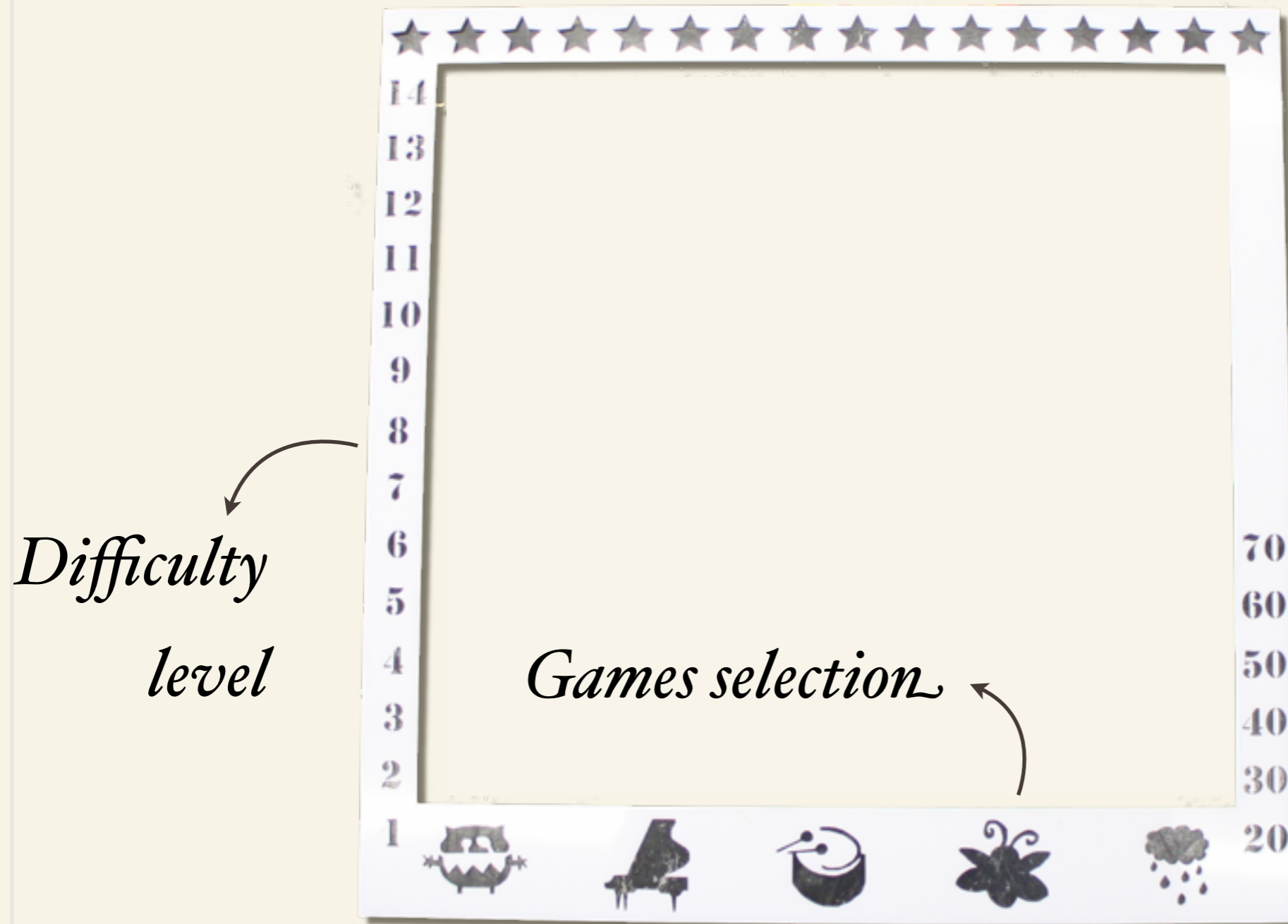
Menu for therapists



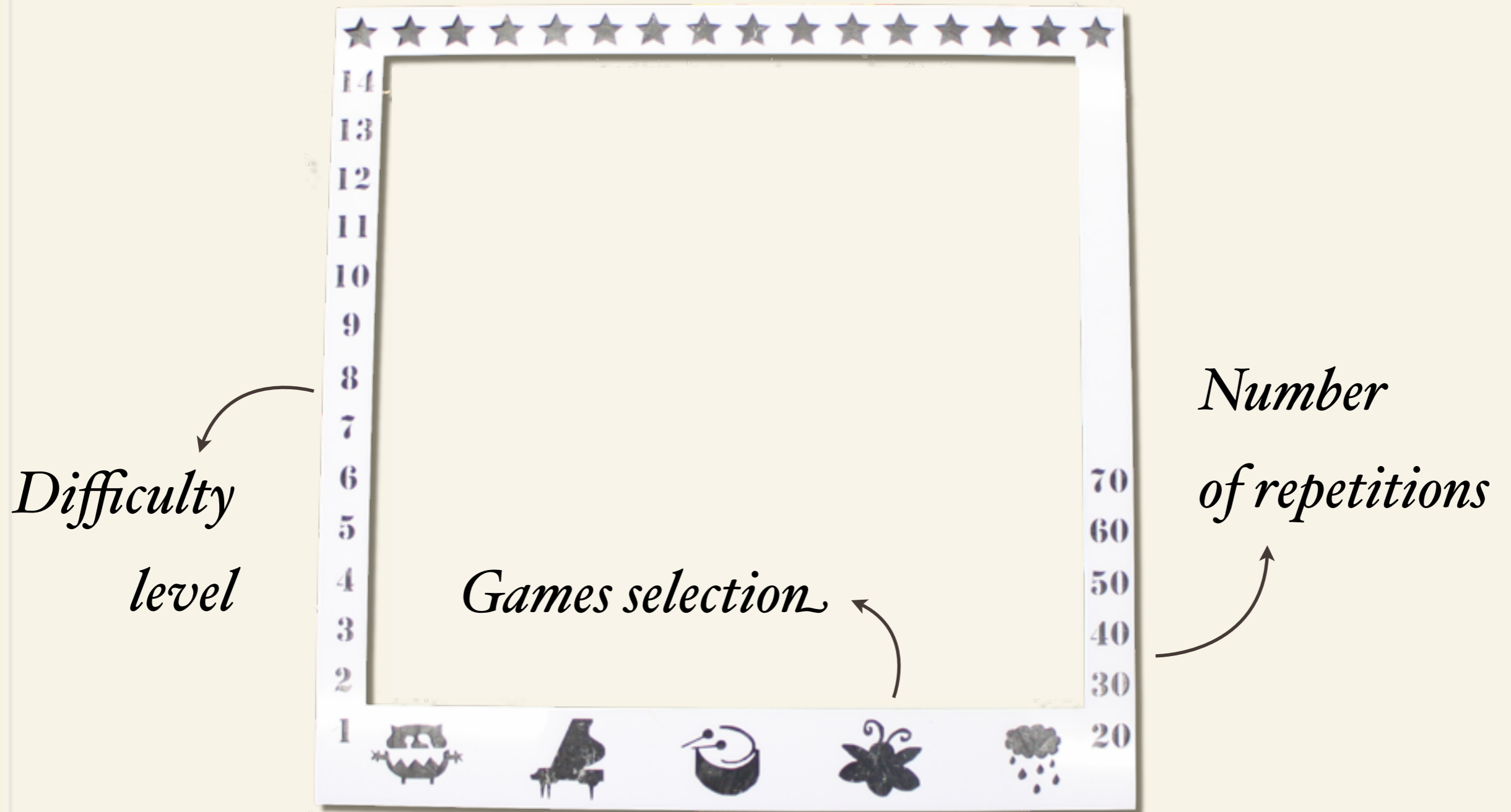
Menu for therapists



Menu for therapists



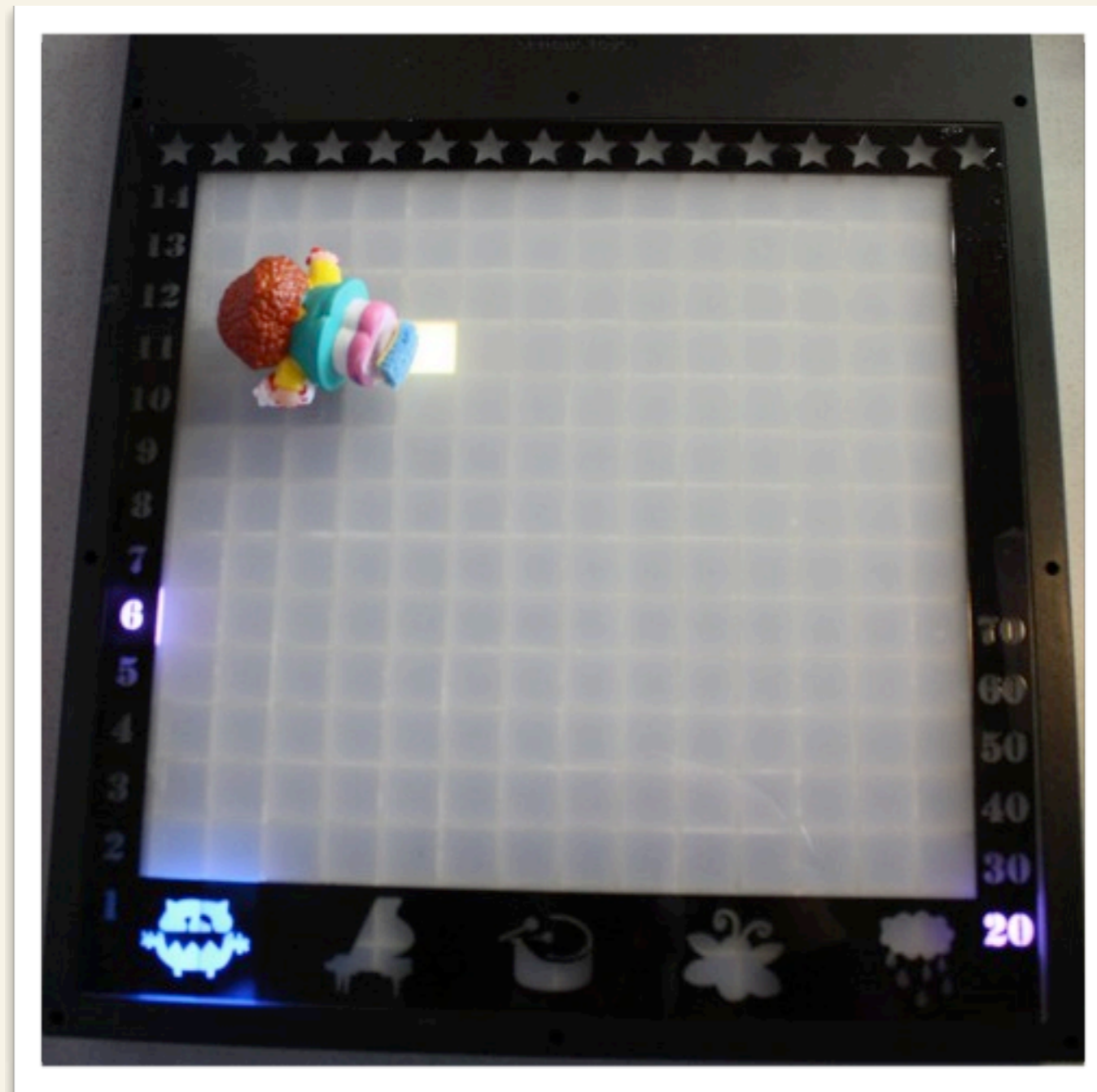
Menu for therapists



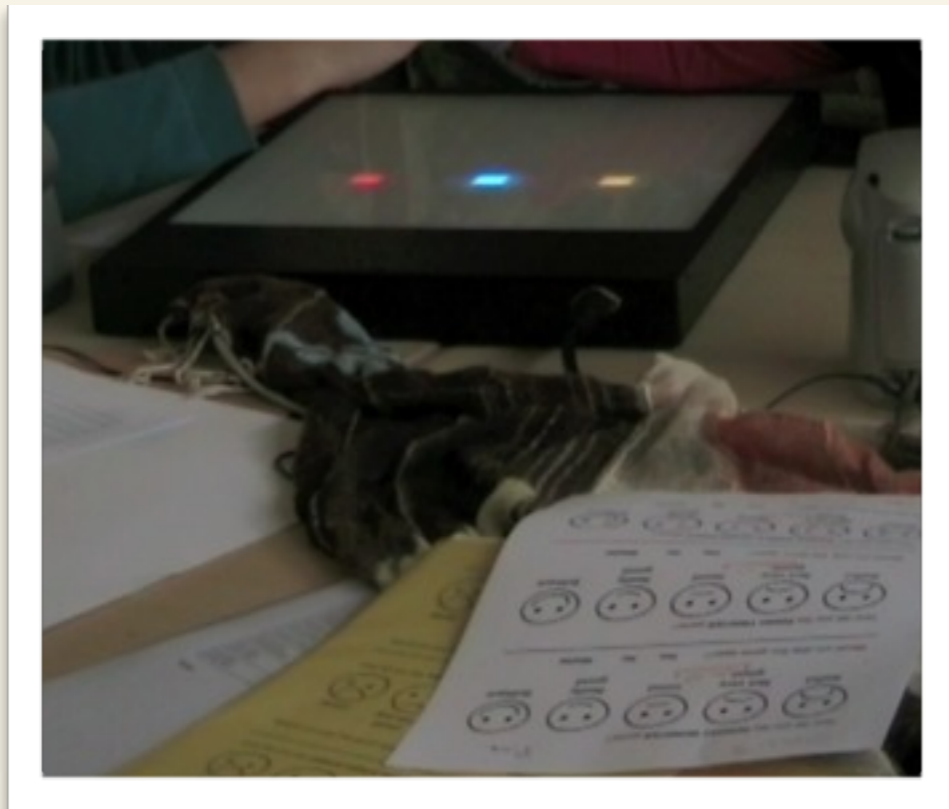
Menu for therapists



The prototype



Evaluations



Evaluation 1: Healthy children



Evaluation 2: Children with CP

2 meetings with therapists in between

Evaluations

Fun to play and engaging

Trains the movements

Good sounds and motivating feedback

Menu is therapist friendly

Games and objects are child friendly

Evaluations

Game levels need adjustments

Some objects needs to be changed

Dealing with board limitations

Discussion

Client centered design

Different therapist - different feedback

Importance of objects

Feedback

Future possibilities

Real time adaptivity

Migration to the blue board

Bilateral CP

Analyzing the movements and games by experienced
physiotherapists

Thank you!

