IACT 730 Winter 2020 Prof. Sung Park

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Children's Experiential Memory Aid

Creating a personal AI assistant to enhance children's experiential memory

Executive Summary

The world is a complex place for kids. Just completing everyday tasks can be daunting when curiosity and adventure are a top priority. Kids need a companion to help them stay on task and remember all the important and fun things going on in their lives.

Here is where Tuki comes in. Tuki allows parents to assign routines to their kid in a fun interactive way to help kids remember what comes next. Tuki also allows you to see the progress your child makes in a handy application on your phone.



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Project Lead
MA Design Management



Brieana Nestler
Research Lead
MFA Service Design
BA Sociology



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Creative Lead
MFA Service Design
MEng Structural Engineering



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Prototyping Lead
MFA Service Design



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User Experience Lead
MFA Design Management
MA Industrial Design



Xiaoxiao Chen Programming Lead MA Design Management

OUR TEAM

ROLES & RESPONSIBILITIES



- Oversee project goals
- Facilitate group meetings
- Manage group assignments
- Look into the overall plan

Research Lead

- Oversee research plan
- Work with team to align research and design

Creative Lead

- Manage consistent design
 language across the board
- Provide creative insight for presentations and other deliverables

Prototyping Lead

- Provide direction for prototyping methods
- Manage the prototyping process
- Analyze the results of the prototyping

User Experience Lead

Oversee user experience
 methodologies, usage, and language

Programming Lead

- Lead and proof the programming for the project
- Delegate coding responsibilities
- Finalize programming

Research

- Topic of Interest
- Secondary Research
- Primary Research
- Affinity Mapping
- Insights

Ideation

- How Might We
- Concept Brainstorming
- Concept Selection
- Initial Concept A
- Initial Concept B
- Quick Concept Testing
- Tuki 2.0

Prototyping

- #1: Low-Fi Prototype (App)
- #2: Wizard of OZ (System)
- #3: Appearance Testing (Physical Product)
- #4: Brand Testing

Final Concept

- Tuki Persona
- Instruction Video
- Customer Persona
- User Persona
- Current Experience Map
- NEW Experience Map

Implemental

- Digital Product
- Physical Product
- Al Component
- Programming

Marketing

- Competitor Analysis
- 5 E's
- Branding
- Vision Video

Appendix

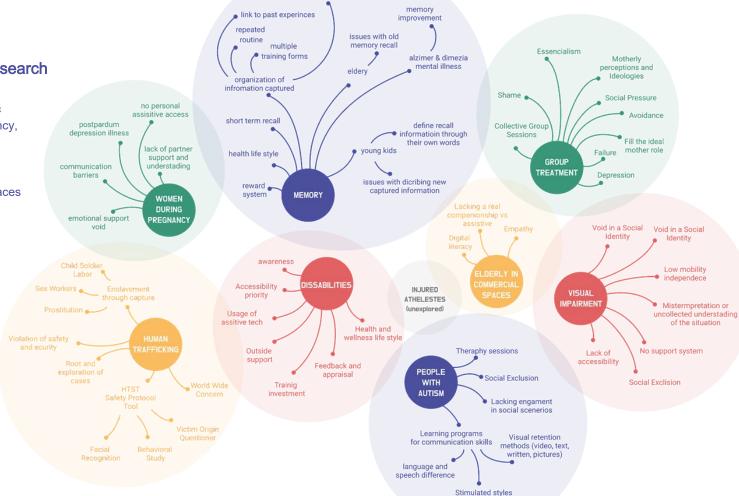
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 - Cultural Probe
 - Interview
 - Drawing Study
 - Observation
- Affinity Mapping
- Insights

Mind Map Based on Secondary Research

We started with eight broad topic spaces to design within: Pregnancy, Memory, Human Trafficking, Disabilities, Autism, Visual Impairment, Group Therapy, and Elderly people in commercial spaces

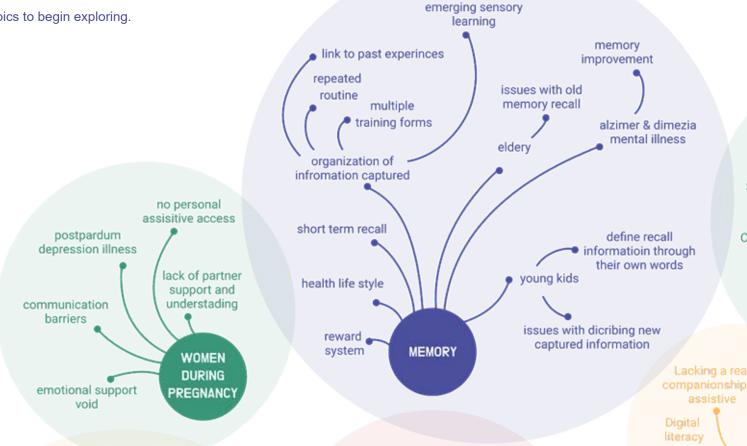


of learning

emerging sensory learning

Topic Selection

We then voted on two top topics to begin exploring.



Topic Selection

Measurement of Feasibility, Desirability, Accessibility

On Scale 1-5		Feasibility		Desi	rable	Access		
	Tech (Product)	AI (Goal)	System	Attract	Extend	Research Access	Testing Access	TOTAL
Pregnant	3	3	4	5	3	5	3	26
Memory	5	4	3	4	5	5	4	30

Feasibility: By examining the possibilities of technical limitations in Arduino, using AI to make something, and the realism of creating a full support system *memory* was agreed upon as a more feasible topic.

Desirability: Would these be products people will want and keep was our priority questions. In this category, while pregnant women would definitely buy into the product because of the market space available, the possibilities of extending the system outside of pregnancy was limited. Again *memory* was unanimously a more desirable product.

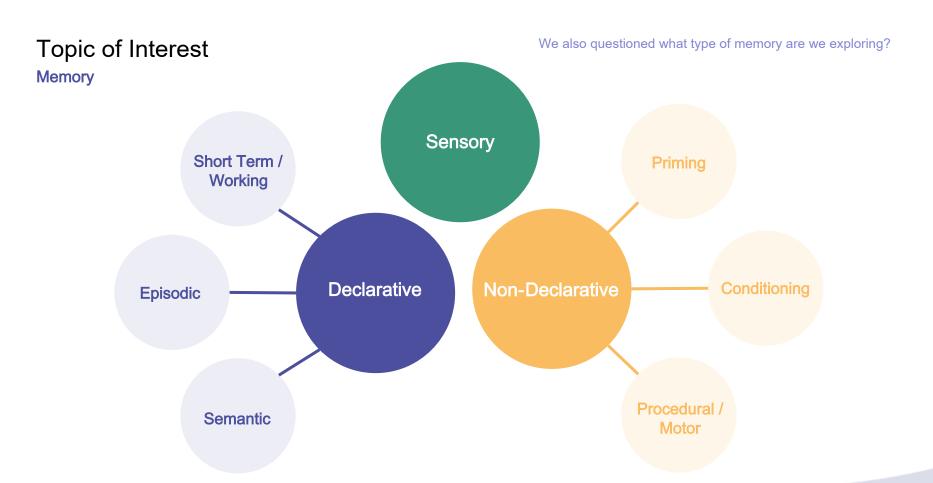
Accessibility: Given how many children versus pregnant women we have access to research and test with, memory became the winner again.

Through a matrix of the design principles Feasibility, Desirability, and Accessibility we explored the two topics further.

"The multiple systems model posits that memory is *not a single, unitary system* that relies on one neuroanatomical circuit; rather...

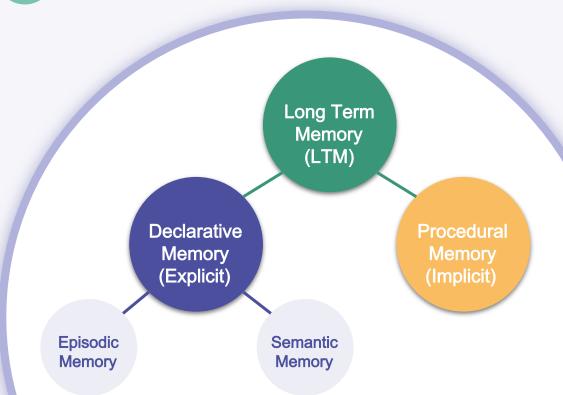
made up of multiple memory systems that can work *independently* of one another."

Early in our research, we stumbled through how we were to tackle such a broad and very well established field. Are we concerned with linear mechanical cognitive processes or contextual situations we use memory?



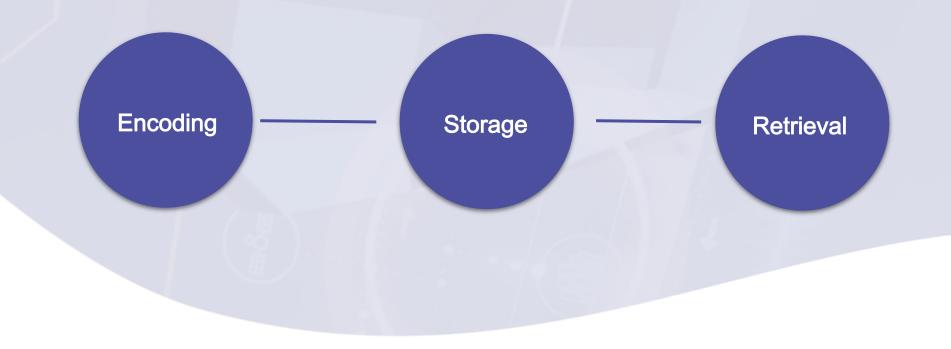


Long Term Memory is categorized as sensory, working, and long term; memories are encoded and then recalled in various contexts. Long Term Memory (LTM) in particular is largely divided into two categories, the implicit and explicit. Procedural memories are implicit, they are unconsciously recalled, such as the steps in brushing your teeth. The memory is unconsciously recalled and completed with little conscious thought. Explicit memory on the other hand is that which is consciously recalled upon, such us remembering a family holiday or the state capital of Georgia during an exam



Topic of Interest Memory Development in Children

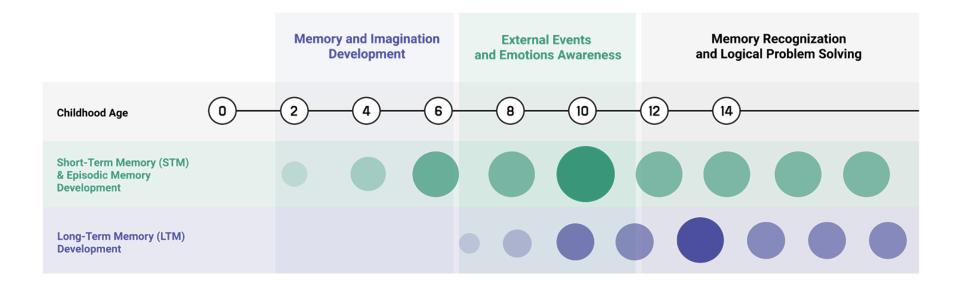
Early on we knew we wanted to create something for children and their memory development, but still questioned what part of the memory process are we investigating?



Topic of Interest

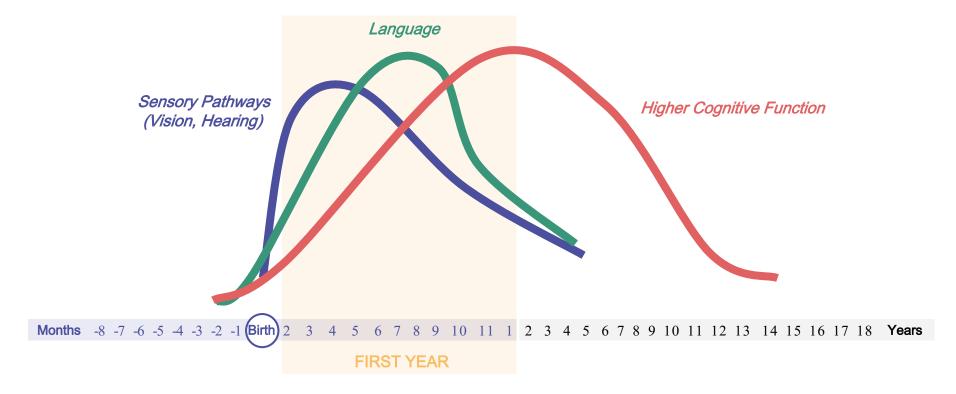
Through our research we found a prime age range of 514 years old, since this is when Long Term Memory really begins flourishing.

Memory Training in Children



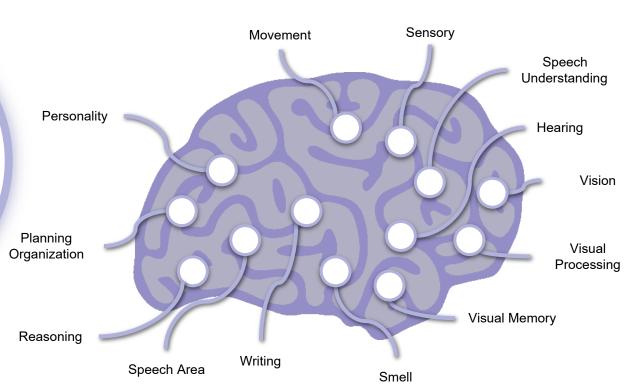
Neural Connection Development

Secondary Research



Child Psychology Brain Sections

Memory development is traditionally described through means of neurobiological and cognitive processes internally within the brain. However, when designing new technologies this purely neurobiological perspective neglects the complex contextual moments in which memory is both encoded and recalled.

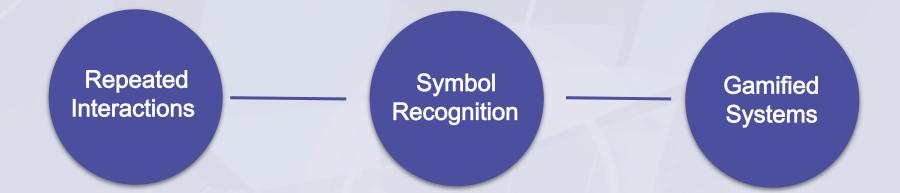


I think we need a more general conception that may be called experiential memory, that is, memory that is derived from personal experience in everyday living, some of which is procedural and perceptual (PP), and other declarative (DM), expressible through mimetic means.

We followed a sociocultural approach to memory, specifically the development of children's memory. A sociocultural framework of memory "recognizes that in development the individual child is situated within a social context that draws on a large complex of cultural understandings and knowledge structures which provide aliment for memory."

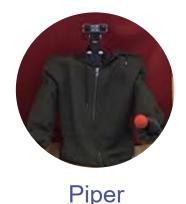
Child Computer Interaction

Secondary Research



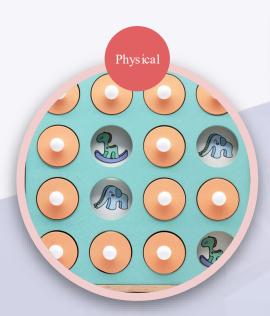
Based on the subfield of Human Computer Interaction: Child Computer Interaction, we learned that whatever we designed would need to utilize repeated interactions, symbol recognition, and a gamified system to keep children engaged with our product.

Artificial Intelligence Secondary Research



As human-robot dialogue faces the challenges of longterm interaction, understanding how to use prior conversation to foster a sense of relationship is key because whether robots remember what we've said, as well as how and when they expose that memory, will contribute to how we feel about them.

Market Analysis Childhood Memory Training



Memory development toys for children fall under two main categories: Card Association and Figure/Symbol Matching. The physical analog products are either card or wooden based.

Then digitally there exists these same exact toys, just through a touch screen interface.



Primary Research

Methodology



Cultural Probe



Interview



Drawing Study



Observation

Cultural Probe Introduction



Understanding how children encode and **retrieve** long term memories based on **sensory cues**.

Participants (15 in Total)

- 5 Children
- 10 Parents

Cultural Probe Results

- Children loveanimated characters
- Children repeat what they know
- Children want colorful balloons
- Children needencouragement
- **Don't restrain** the thinking of kids
- Parents are veryprotective of their kids

While we had interesting takeaways, this research method was found to not be the best methodology to tackle the complexity of the issue we wanted to explore.



Interview Introduction

Time & Day
33 Parent Mentions

I don't know

10 Child Mentions

According to Parents and Teachers, children need assistance with retrieving all types of Long Term Memory.

Children often lose items, forget procedures, and episodic memories.

Participants (16 in Total)

- 5 Children (Age 510)
- 6 Parents
- 5 Teachers (Teaching children in age \$10)



Parent Have Negative Assumptions Of Children Forgetting I think kids are lazy, Because hexnows how to put the shoes in the closet. And then he'll take his shoes off and leave them in the living room and I ask him, 'why the shoes are there?' and he'll say I forgot'. No, he's just being lazy.

Parent 05

Children Really Do Forget Steps Of Processes

Remembering the process is what is hindering them mastering the skill because they know all the steps. And like I said, this comes back to like it is not doing things around the house like having chores.

Teacher 03

Children Have a Hard Time Verbalizing Memory
Description
If i just ask him, 'Do youremember what you did at school?'
He would say, 'No'.

Parent 04

Emotional Attachment to A Memory Allows Effective Encoding

He started to remember things at 3 years old when we just moved to Savannah and we lived our first house there. He remembers it was a wood house.

He is emotional about that house. Every time we talk about that house he wants to cry, he misses it so much.

Parent 02

Children Get Easily Frustrated When Technology Doesn't Work Alexa, can berude 'What can I do for you today.' We didn't even ask anything or say Alexa, we were saying [something

else]. So we will be like **stop it** Alexa.

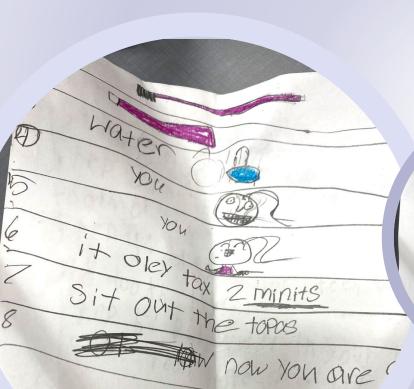
- Child 03, Age 8

VUI Is Not Designed For Children

She's sometimes annoying, but she helps me spell things. Like, I asked her stuff, and she either hears the wrong thing, or she gives me like wrong answers that I already know.

Child 01, Age 7

Drawing Study Introduction



Step 3; get your tooth paste.

Step 3; get your tooth paste.

to oth brust he tooth paste in the

Step 4; brush your teeth With

Step 5; Pht water in your mout

The tooth paste come off.

Topic: How to brush your teeth

Goals:

- Tapping into procedural memory
- The system that children use to link steps of a process
- Things children remember of a day to day process

Participants: 5 Children (Age 5 10)

Drawing Study

Results

- Children understand that there are multiple steps to complete the task.
- Words and drawings help children depict the steps
- One child even used**color** to help highlight the steps
- Children struggle to recall and communicate steps within a process.

Observation Introduction



Hyper aware of our interactions with children and studying their memory informally



Observation

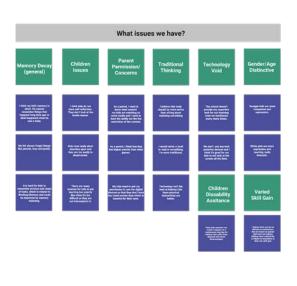
Results

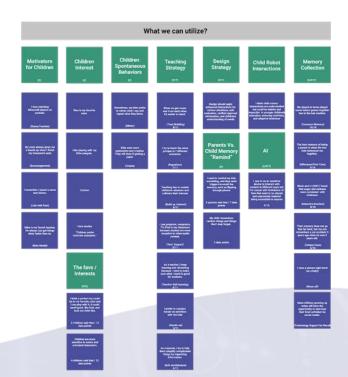
- Children really doforget steps of a process
- Easily **frustrated** when technology does not work
- VUI NOT designed for children
- Very particular and know what they want
- Frequently say"I don't know"

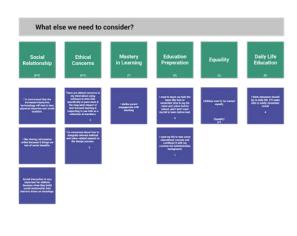
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his sleps to also * rember where y bear ! have one child We don't use any would be **Affinity Mapping** Process my chill be equestion when I get lose ming all he work and Backpack). Mame Tech as learning support wide Mamery Glevia No. my anid doesn't I have 2 kids, one Heract with voice is 6 one is 3.

Affinity Mapping Results







KEY POINTS

Teaching Strategy

(P/T)

Memory Collection

(C/P/T)

Children Interest

(C)

Equality

(C)

Daily Life Education

(P)

ΑI

(C/P/T)

When we get closer and trust each other, It's easier to teach.

> (Trust Building) 8/11

We stayed at home played some indoor games together due to the bad weather.

(Common Memory) 14/16 Blue is my favorite color.

Children want to be treated equally

(Equality) 4/5 I think education should lay in daily life, it'll make kids to easily remember words

4/6

I use AI as an assistive device to interact with content in different ways but I'm concemed with limitations of time that need to be placed and unaccurate material being accessible to anyone

9/16



She's sometimes annoying, but she helps me spell things. Like, I asked her stuff, and she either hears the wrong thing, or she gives me like wrong answers that I already know.

Child 01, Age 7

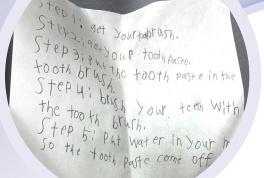


Mater

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TOW YOU are

Sit out the topos



Children struggle with recalling experiential memory on a daily basis and need assistance from their parents and teachers.



As human-robot dialogue faces the challenges of long-term interaction, understanding how to use prior conversation to foster a sense of relationship is key because whether robots remember what we've said, as well as how and when they expose that memory, will contribute to how we feel about them.





Children (Age: 514 years old)



Parents



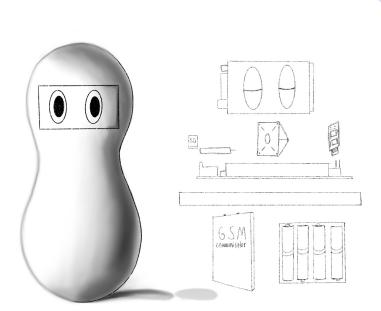
- How Might We
- Concept Brainstorming
- Initial Concept A: Tuki
 - Sketch
 - Storyboard
 - Moodboard
- Initial Concept B: Capi
 - Sketch
 - Storyboard
 - Moodboard
- Concept Testing
- Tuki 2.0
 - Product Sketch
 - APP Wireframe
 - Scenario Building



- 1. Enhance children's Experiential Memory (EM) retrieval?
- 2. Support parents efforts in this process?
- 3. Use AI to assist with this memory retrieval?
- 4. Create a children's AI personal assistant?





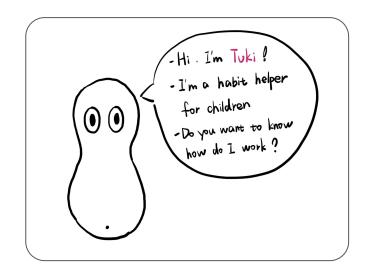


Tuki is a happy helper

that assists children with their **daily routines**, to keep them **focused and excited** to complete tasks assigned to them by their parent.

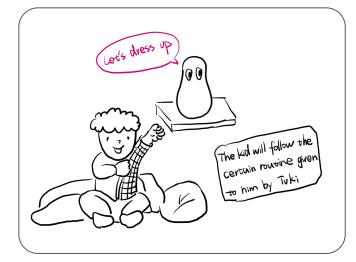
The support App allows parents to assign tasks to routines and then be communicated in a fun gamified way for the child.

Tuki Storyboard

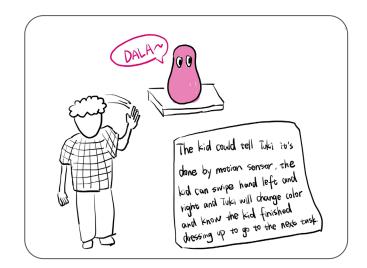






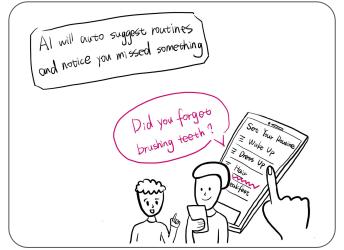


Tuki Storyboard











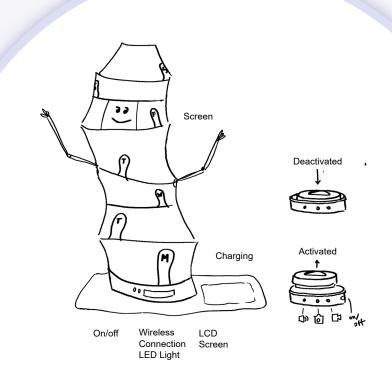


Capi is an interactive lamp

that is able to **capture memories** of both the parent and child in order to continue building **collective family memories** .

At the end of each day families can come together to have real conversations based on the data collected by the mobile capi device and turn on a colorful light for the day.

Capi keeps **7-day memories & lights of a week** .



Capi Storyboard



1. Mom asks son what he did in school, but hecan't never remember.



2. Mom brings home NEW lamp "Capi" for her son.



3. Mom and son record events of the day they like, so they casave their memories of what they did during the day to later visit them.

B

Capi

Storyboard



4. Mom and son arrive home and saved memories of the day get uploaded to Capi.



5. Mom and son interact with Capi, review saved memories with picked up words of the day and share.



6. Mom and son stop sharing their saved memories of the day. A color light turns on representing the emotions of the day.





Tuki

Pros:

- help reduce parents' stress
- Time management/time saving
- Buddy
- Parent involvement to build routines
- Use at home or other places

Cons:

- Will children pay attention?
- Firewall security
- Managing routines in App

Suggestions:

- Unbreakable
- Youtube intro for trust building
- Extend for helping with HW, Assignments, reading, time, alarm, etc.
- Cost \$30-50



Capi

Pros:

- Easy to use
- Learning related
- Bring family together
- Can be at home/ kids room (light)
- Possible Extended usage
- Visual representation of the week
- Stronger relationships for easier communication starter

Cons:

- Capi's small addon device can't go to school
- May not complete the days
- Hard to understand

Suggestions:

- Refine product exterior look
- Combine with Tuki's system functions



Function + Appearance

Function (for parents):

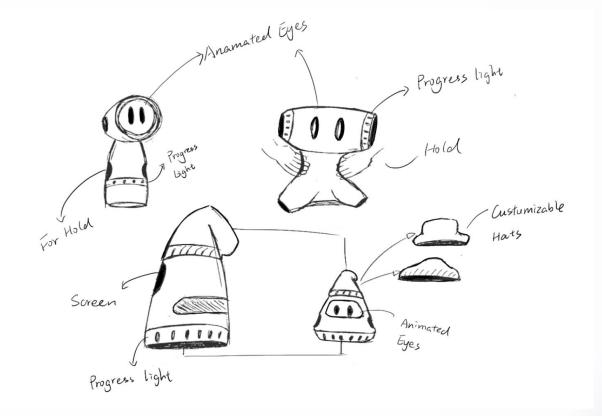
- Routine setting
- Suggestions for plan
- Progress tracking
- Completion visualization

Function (for kids):

- Task Guide
- Voice encouragement
- Progress tracked by Light

Appearance:

- Eyes
- Lights to show the progress of week
- Round shape



App Wireframe (Digital)

Heuristic Evaluation

Based on Nielson's 10 Usability Heuristics Modified an existing Heuristic Evaluation Checklist (Pierotti)

Key Features

- 1. Visibility of System Status
- 2. Match Between System & Real World
- 3. User control & Freedom
- 4. Consistency & Standards
- 5. Error Prevention
- 6. Recognition Rather than Recall
- 7. Flexibility & efficiency of use
- 8. Aesthetic and Minimalist Design
- 9. Help Users recognize, diagnose, and recover from errors
- 10. Help & Documentation

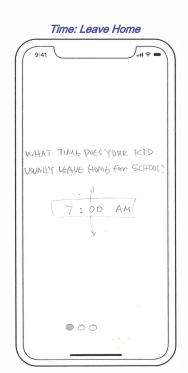


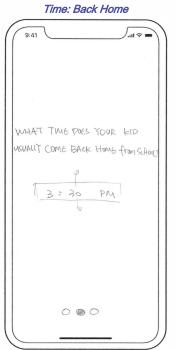


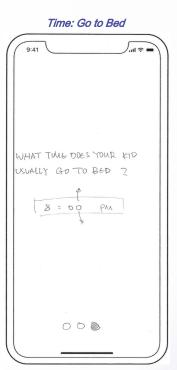


App Wireframe - Basic Info

Basic Info can help Tuki better understand users so that Tuki can support parents to **organize time and make plans** by give auto suggestions.







App Wireframe - Completion Tracking

Daily Completion Weekly Completion ▲ Feb. 16-22 ₩ B M TO W Th FS SOOOTBS SMTWT Wake up On Time 1/5. 1 3 4 0 0 0 0 Bruh Touth 3/5 Wash Face 3/5 Eat Breakfast 415 Get Bay & Belongings 4/5 Go to school 4/5 23 24 25 26 27 28 29 Homework Reading 315 Dimer 415 Take Shower 415 Brush Tooth 415 As to Bed 415

Monthly Completion

6 0 0 0 6 6

1) 18 19 20 21 22

Event Setting

0

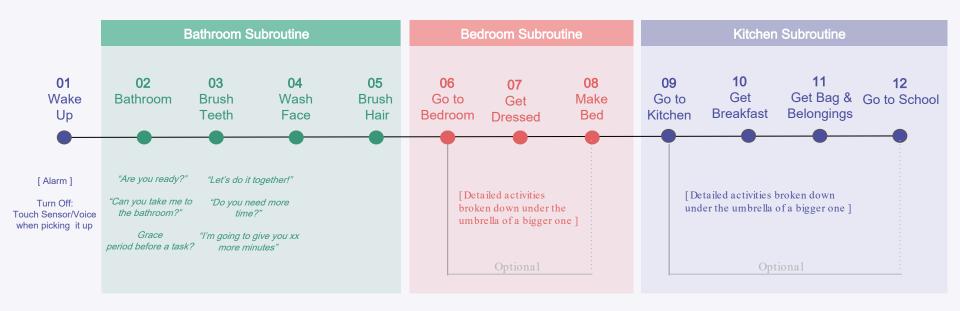
None >

Feb. 16 2020

Completion tracking can help parents' better understand their kids and make plans.

Scenario Building (Physical) Morning Routine

The Scenario follows a **morning routine** of a child during a school day, following a step by step activities that need to be considered for further **Parent App** activity set up and **child interactions**.





- Prototype #1:
 - Low-Fi Prototype (App)
- Prototype #2:
 - Wizard of OZ (System)
- Prototype #3:
 - Appearance Testing (Physical Product)
- Prototype #4:
 - Brand Testing

Prototyping #1 Low-Fi Prototyping (APP)

To understand the parent usage of

- Onboarding process
- Flow of UI interactions
- Easy Access to:
 - o Calendar
 - Setup of activities
 - o Timeframe of activities
 - Observed progress
 - Suggestive add-ons

Participant: 5 parents (4 moms & 1 dad)

Location: Gulfstream & Shed

Duration: 2 days





- Parents like the clean interfaces.
- **Suggestions** from Tuki let parents easily make plans.
- **Two steps** to set up one routine saves time for parents.
- Parents like the **tracking of completion**.



- Parents want suggestions based on the age of kids.
- Parents think kids with an older age (more than 10 age) might not follow the steps from Tuki.
- Parents want more graphic ways to see the progress and completion.

Prototyping #2 Wizard of OZ (System)

To understand the systematic functionalities of

- Voice Interaction
- Script Conversational
- Triggers (activities)
- Eye Movement
- Time management
 - o Light of progress 50-100%
 - Music timelapse

Participant: 3 Kids in Total

- Boy A, 8 years old
- Boy B, 7 years old
- Girl A, 5 years old

Location: Gulfstream & Sheds

Duration: 2 days







Prototyping #2 Wizard of OZ (Scenarios)







Similarities

- Less talking from Tuki
- Want music more than words
- Color and lights would be attractive
- Prefer to tap the top of Tuki

Differences



Girl A, 5 year old:

- More trust
- Willing to follow the steps



Boy B, 7 year old:

- Quick Learning
- Actively interacted with Tuki



Boy A, 8 year old:

- "I don't want it"
- More mastery to set up routine & event
- Reminder rather than routine helper

Kids want more mastery with age

Prototyping
3
Appearance Testing

Aims to understand

- Model Look/shape/material
- Capability in traveling to different rooms
- Touch sensors

Participant: 5 Parents and 3 Kids in Total

Location: Gulfstream & Shed

Duration: 2 days



Prototyping # 3 Takeaways





- Easy to move
- Multiple eyes on Tuki
- Interact with expressive eyes
- Voice encouragement when completed
- Light color change when completed



- More customized (color)
- More round (shape)
- Metallic surface
- Transparent material for light part
- Like the hair-like top
- Robotic voices

Prototyping # 4
Brand Testing



Participant: 5 Parents and 3 Kids in Total

Location: Gulfstream & Shed

Duration: 2 days



Prototyping #4 Takeaways

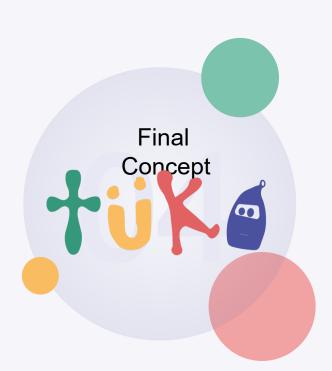
Kids preferred a **fun** approach to the logos with **wider** letter shapes and **color variations**.

In contrast, *Parents*, preferred a more dynamic look related to the meaning behind each letter, still having akids-like style and being easy to read.



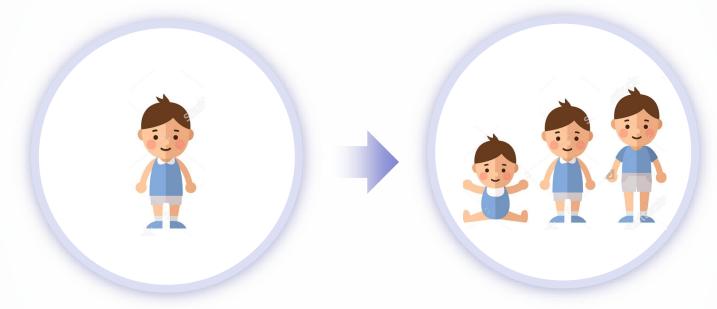
Majority selected by 3 kids

Majority selected by 5 parents



- Tuki Persona
- Instruction Video
- Oustomer Persona
- User Persona
- Ourrent Experience Map
- NEW Experience Map

Tuki 3.0 Function



Routine Helper

Active Happy Helper Grow up with Kid (5-10 age)

Kids between 5 and 10 are more susceptible to the goal of Tuki's functions and features



Tuki

"Will you be my friend?"

The younger sibling of Alexa, Siri, Echo, and Google, **Tuki** is made **just for kids**, with their needs in mind. Tuki likes to **make boring things, fun!** Tuki will tell kids what a good job they're doing, remind them of what to do next, play fun music while completing tasks, and light up cool colors!

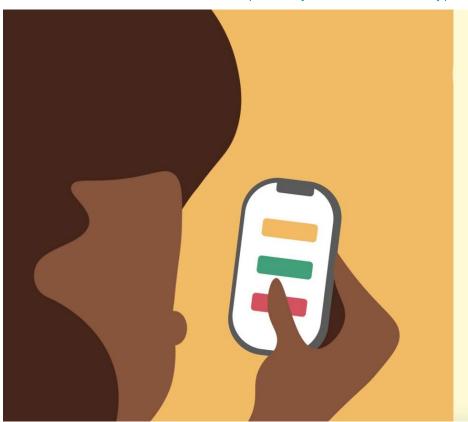
Voice

- Monotone
- Robotic
- Playful
- Encouraging
- Minimal Emotions





https://www.youtube.com/watch?v=77jqNJvCCYY







Trish, 28

"Morning is a rush. It's hard to keep up with getting ready."

Age: 28 years old

Job: Full time Professional Stylist

Status: Divorced

Value family and time

Goals

Trish would like to have an affordable device that contains features that she already has in her home but is dedicated to her son.

Frustrations

- Limited time for schedule
- maintain a stable routine with her son across households

UX Needs

- Easy flow
- Weekly Suggested Plans
- Recommendations
- Visual Feedback











iPad

iPhone

Alexa

Laptop



Ky, 5
"I don't know."

Age: 5 years old

Grade Level: Kindergarten

- More Trust
- Willing to learn
- Curious about new

Goals

The ability to follow steps through a unique and interactive learning experience.

Frustrations

- Struggle with learning the basics of everyday routines
- Voice recognition in Alexa doesn't pick up Ky's voice commands

UX Needs

- Visually pleasing
- Interactive
- Encouraging









Kid e-Pad Mom's iPhone

Alexa (Mom's house)





"I don't want to be told what I need to do.
I just want to remember better."

Age: 8 years old

Grade Level: Third Grade

- Quick Learner
- Actively Interacted with Tuki
- More mastery

Goals

Master the steps for a routine he needs to complete without being told

Frustrations

- Wants a device that he can trust doesn't tell on him if he doesn't follow his routine in the right way
- Struggles with following up on homework

UX Needs

- Informative
- Reminder
- Encouraging







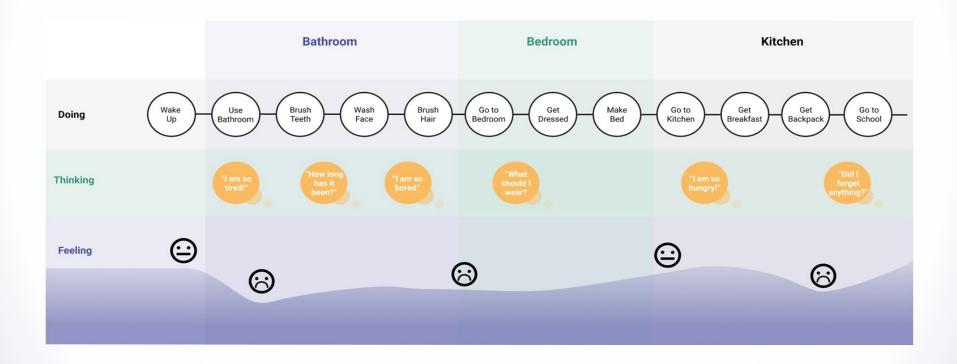


Alexa (Mom)

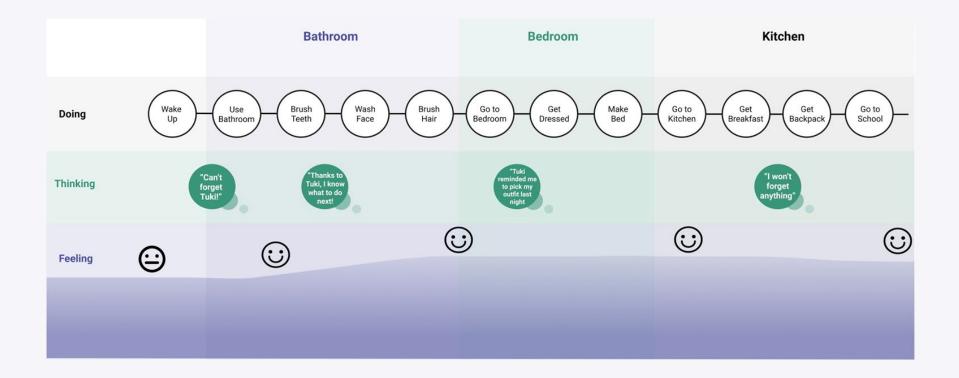


exa Google Home (Dad)

Current User Journey









- Digital Product
- Physical Product
- Al Component
- Programming



Onboarding:

Colorful interface represents kid -friendly feature that matches with the branding.

Fun shape with Tuki icon on the top guides parent or family member to connect with the physical device of Tuki.

Basic Info can help Tuki better understand users so that Tuki can support parents to **organize time and make plans** by giving automatic suggestions.

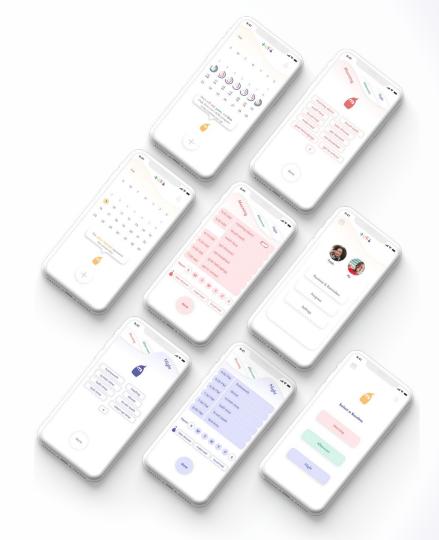




Quick setting process streamlines the complicated step which can reduce parent's daily stress.

Realtime routine schedule management adapts to the relevant feedbacks that can match with the kid's interests and personality.

Completion tracking can help parents' better understand their kids and make upcoming routine plans.







Form

- Kid-friendly rounded shape
- Robotic
- Inviting shape to hold top
- Flat bottom for stability
- Hat top makes it character like (easy to customize)

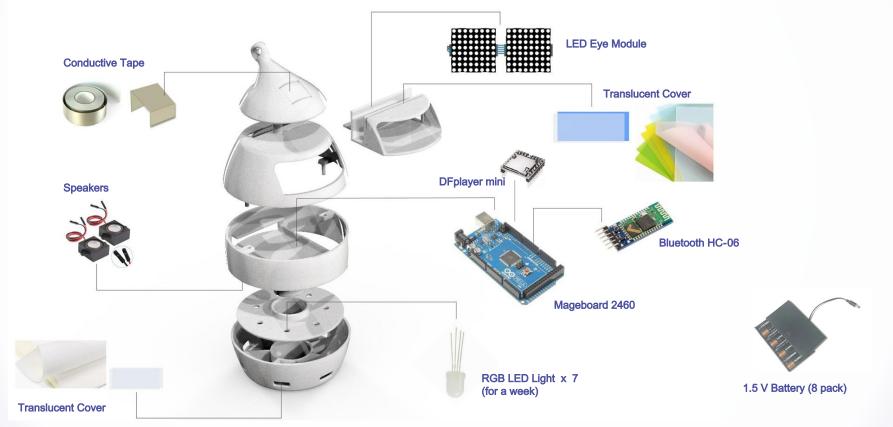
Material (prototype)

Plastic (3D printing)

Material (in the future)

- Metal like plastic
- Matte surfaces make it easy to hold

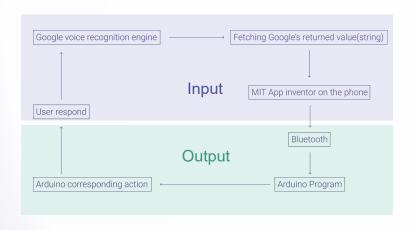












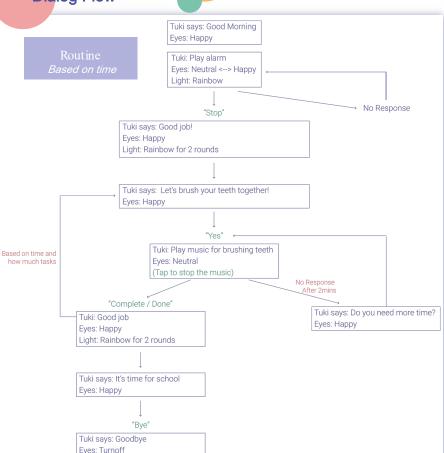
How Tuki learns from users ☐ (unique AI, predictive analysis)

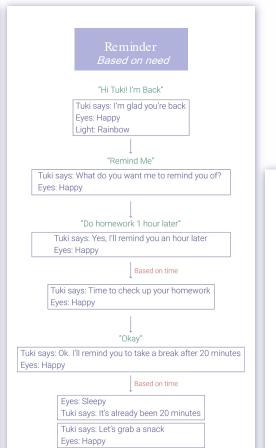
A major concern from most adults was "what if the child is lying" about their task completion.

Through machine learning and testing the product, **Tuki can collect large sets** of data on the timing, tempo, and firmness of the tapping a child does to know if the child is lying (i.e. Multiple quick taps in a certain span indicate that the child is rushing through the tasks and not properly completing them).

Over time and with more interactions, **Tuki can learn to be a better helper**, adjusting to routines such as which tasks children need more time to complete.

Programming Dialog Flow





Bedtime Based on time

Tuki says: You completed all your tasks! Now you can pick a color! Eyes: Happy

"Red / Orange / Yellow/ Green/ Blue/ Purple/ Pink"

Tuki says: Great Choice! Eyes: Happy

Light: Rainbow for 3 rounds and light up the certain color for certain day

Tuki says: Good night
Eyes: Happy
Light: All the remaining
lights are white
Eyes: Sleepy
(Tap to turn off)

Programming Coding

MIT App Inventor (Voice Recognition)



Arduino (Voice Interaction)

```
Main_Code_Final | Arduino 1.8.10
       Main_Code_Final
void loop()
   String state;
   while (Serial.available()) {
     delay (10);
     char c = Serial.read():
     state += c:
   // morning routine
  if (state.length()>0) {
   if (state == "morning routine") { // GOOD
     eyesHappy();
     myDFPlayer.play(1);
                               //play "Good morning"
     delay(1800);
     myDFPlayer.loop(37);
                                // play alarm
     alarm();
   } else if (state == "yes") { // GOOD
     eyesNeutral();
     myDFPlayer.pause();
     myDFPlayer.loop(39); //play music for brush tooth
     timer():
   } else if (state == "bve") { // GOOD
     evesHappy():
     myDFPlayer.play(35); // play "good bye"
     delay(1800):
     delay(3000);
     eyesOff();
   } else if (state == "hi I'm back") { // GOOD
       rainbow();
       liahtoff():
       eyesHappy();
                                //play "I'm alad you're back"
       myDFPlayer.play(9);
       delay(2000);
       eyesNeutral();
  } else if (state == "remind me") { // GOOD
       eyesHappy();
       myDFPlayer.play(11);
                                 //play "What do you want me to remind?"
       delay(2800);
```



- Competitor Analysis
- 5 E's
- Branding Development
- Vision Video
- Instruction Video

Competitor Analysis





	Cos	Kid-Friendly	Modality	Form
Tuki	\$\$	Yes	Touch, Voice	Transportable
Alexa	\$\$	Parental Controls	Touch, Voice	Stationary
Siri	\$\$	Parental Controls	Touch, Voice	Transportable
Google Mini	\$\$	Parental Controls	Touch, Voice	Stationary







01 Entice

Attract with YouTube Character video

Tuki Pamphlet with Features and interactions

02 Enter

Subscription through Tuki App

Sync Phone App to Tuki device (using Bluetooth)

Setting Up the user's criteria

03 Engage

Daily activities & Schedule routines

Light Color Selection as Motivators and reward for kids

Tuki Al Active Interactions during tasks

Suggestive feedback for parents

04 Exit

Kid level stage transition

Pass it on to next family member

05 Extend

Kid level stage transition

Wireless updates of App systems

Tuki model updated features

Other learning Oppt addons



Brand
Development





HAPPY HELPER. HAPPY HOME

The logo's curves mirrors the product's exterior curved form. The meaning behind Tuki's name, translated from Finnish, meaning supporter, aid, and assistance. Therefore, the phras 'happy helper' was believed to be fitting for this to be the true identity of what a kid-friendly social robot should represent.





The 'u' is represented as the happy helper, yellow color, buddy that adapts with kids as they age.







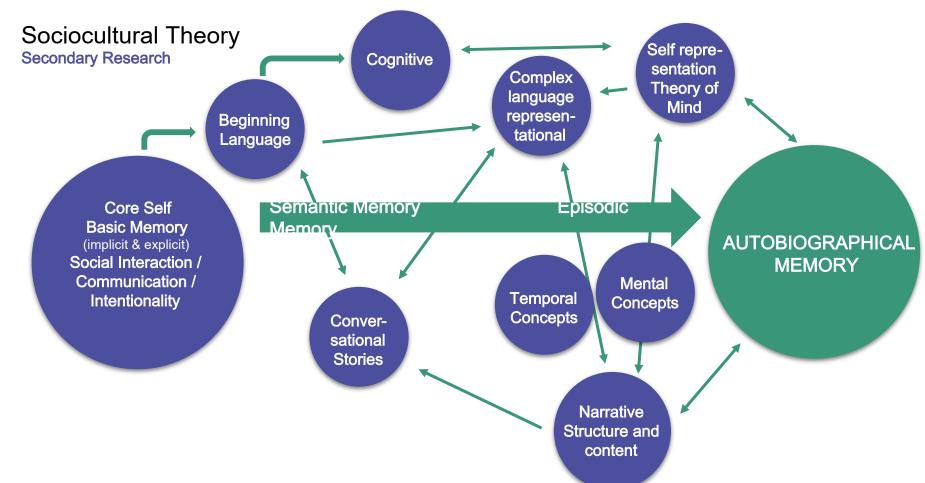
And lastly, I'as tuki itself that represents the mediator between parent and kid's communication with color as purple that reflect the indepence kids can practice in a magical experience.







- Research
- Concept Cloud
- Low-Fi Wireframes
- Hi-Fi Wireframes
- Raw Codes
- Process Photos



Interview Scripts Directed Storytelling

Do you try to remind your child to let them remember something? How do you do that? What methods you think are helpful?

Script Teachers:

Thank you so much for taking the time to talk with me today. As I told you, we're doing design research to understand children's memory and learning. Everything you say today is going to remain anonymous and used only for research purposes. I really appreciate you giving me your insights on how we can design something really amazing. If it's ok with you I'll go ahead and start the recording.

Walk me through your career and background

Why did you become a teacher?

How long have you been teaching?

What do you teach? (Age, subjects)

What do you love about teaching?

What do you least enjoy about teaching?

What's your teaching style or philosophy?

What is the relationship between memory and learning?

In your experience what do you think children have the most trouble remembering?

What technologies do you use in the classroom?

Which technologies do you think are the most helpful in teaching? Least helpful?

Do you have a story you can share about technology and teaching?

Interview Protocol: Adults

Many questions are from the Use of the Everyday Memory Questionnaire With Children.

Script Parents:

Thank you so much for taking the time to talk with me today. As I told you, we're doing design research to understand children's memory and learning. Everything you say today is going to remain anonymous and used only for research purposes. I really appreciate you giving me your insights on how we can design something really amazing. If it's ok with you I'll go ahead and start the recording.

Please tell me about vourself

How many children do you have?

How old are they?

What grades are they in?

Tell me about your favorite memory of being a parent?

What did you do over the holiday break?

Does your child watch youtube? What do they watch on youtube?

Do you have Alexa, Siri, Google, etc?

Does your child interact with it? Do they like it? Do you like it?

What do you wish it could do?

What do you wish it could do?

Does your child lose things? Can you tell me about a time your child lost something?

Does your child forget things like what happened yesterday, a month ago, or longer? Can you tell describe a time this happened?

Does your child repeat jokes or stories?

What's your child's favorite toy? Why do you think it's their favorite?

If you could make the perfect toy for your child what would it be? What would it look like? What would it do? What would it sound like?

Interview Protocol: Children

https://uxdesign.cc/user-research-tips-for-interviewing-kids-ae686e5324ac

With children one on one interviews need to be engaging to keep their attention, also fun and not boring like a test. Need to remain flexible with the structure and order, be comfortable jumping around. Don't be afraid of leading questions, unlike other age groups, children need more quidance. Let their imagination run wild! Must be less than 1 hour!

Questions Ideas:

- How old are you?
- What grade are you in?
- Do you like school?
- (Why)
- What's your favorite subject at school?
 - (Why?)
- What did you do during the holiday break?
- What's your favorite color?
 - What's your parents favorite color?
- What video games do you play?
 - Why do you like them?
- What is your favorite toy?
 - Why?
- What is your favorite food?
- What is your favorite movie?
- What is your favorite TV Show?
- Who are your friends?
- What do you want to be when you grow up?
 - Do you know what you friends what to be when they grow up?
- Do you watch Youtube?
 - What do you watch on Youtube?
 - Why?
- Do you have Alexa, Siri, Google, etc?
 - What do you like about (Alexa, Siri, Google, etc.)
 - What don't you like about (Alexa, Siri, Google, etc.)
- What does the word forget to mean?
- Do you forget things? Can you tell me about a time you forgot something?
- Can you remember being a baby?
- If you could make the perfect toy or thing to play with what would it be? What would it look like? What would it do? What would it sound like?

Prototyping #2 Pre-recorded Audio



Tuki Voice Script - Morning Routine, During the Week, Before School

WAKE UP Scenario

Music sounds as a alarm (wake up alarm)

N/A Audio- "Good Morning! I am so excited for today! Are you ready?"

Audio 1-"Good morning! It's time for us to start the day!"

Audio 2-"Time is 8:00am, tempature's outside are 80 degrees"

Audio 3-"Good morning! It's time for us to wake up!"

Audio 4-"We need to get ready for school today!"

Audio 5-"Are you ready?!"

Audio 6-"Do you want to get ready with me?"

Audio 7-"Did you get a good rest?"

Audio 8-"Rise & Shine! It's morning. Do you know what that means? It's time to get ready together"

Audio 9-"Rise & Shine! It's time for us to get ready together"

BATHROOM Scenario

Audio 10-"Do you want to go to the bathroom together?"

Audio 11-"Would you like to get ready now?"

Audio 12-"Are you ready to: brush your teeth, wash your face, brush your hair?"

Audio 13-"Are you ready?!" {repeated in Audio 5}

Audio 14-"First we need to: brush your teeth, wash your face, brush your hair"

Audio 15-"Do you want to get ready together?"

Audio 16-"Let's go to the bathroom together! There, we can get ready."

Audio 17-"Let's go to the bathroom! We can get ready together!

Audio 18-"Can you take me to the bathroom! We can get ready together!

Audio 19."If you need more time say, 'Tuki I need more time!' If you are already done say, 'Tuki, I'm done'

Audio 20-"Do you need more time?"

Audio 21-"I'm finished! Did you complete: brushing your teeth?!"

Audio 22-"I'm finished! Did you complete: washing your face?!"

Audio 23-"I'm finished! Did you complete: brushing your hair?!"

BEDROOM Scenario

Audio 24-"Now that that's done, can you take me to the bedroom now?

Audio 25-"Let's make the bed ready together!"

Audio 26-"Let's get our stuff for school!"

Audio 27-"Do you have your backpack?"

Audio 28-"Don't forget to get your stuff before school!"

Audio 29-"Let's make the room before you leave for school!"

Audio 30-"Let's make the room together before you leave for school!"

KITCHEN Scenario

Audio 31-"I'm feeling a little hungry! Do you want to get breakfast together?"

Audio 32-"Do you want to get breakfast together?"

Audio 33-"Now that that's done, do you want to get breakfast together?"

Audio 34-"Can you take me to the kitchen now?"

Used scripted pre-recorded audio for Wizard of Oz scenario walkthrough but **changed** its usage through different participants **preference**

Audio 35-"Would you like to get breakfast before going to school?"

Audio 36-"Maybe we can grab food before school!"

Audio 37-"Would you like to eat together?"

Audio 38-"You know, getting breakfast is an important part of the day!"

TRIGGER Scenario

Audio 39-"That's me! How can I help my best friend?"

N/A Audio-"I only know a few words, but my big sister Alexa knows everything"

LEAVING FOR SCHOOL Scenario

Audio 40-"Goodbye now! I'll see you later today"

Audio 41-"Goodbye!"

Audio 42-"See you later!"

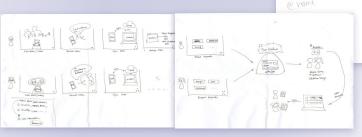
Audio 43-"Goodbye! Looking forward to seeing you later today!"

Audio 44-"Goodbye! Have a great day at school!"

See you later alligator!

Concept Selection

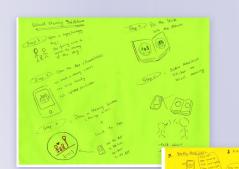
Concept Cloud





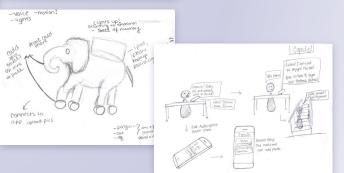


.ell is a wearecould be a weath
Oz moylea light up
SHOE?? (nochees)
proficals
button sides)









meant for out of house

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Audio 42-"See you later!"

Audio 43-"Goodbye! Looking forward to seeing you later today!"

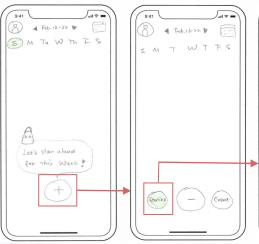
Audio 44-"Goodbye! Have a great day at school!"

See you later alligator!

Morning Routine Setting (with Tuki Suggestion)

Evening Routine Setting

(with Tuki Suggestion)













Digital Product



















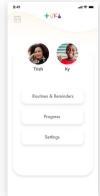














Digital Product



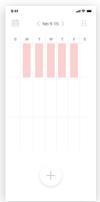












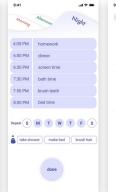


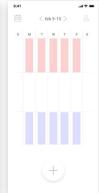


30 mins

















Programming **Arduino Coding**

#include <arduino.h> #include <softwareserial.h> #include <ofrobotdfpleyermini.h> #include <ledcontrol.h> #define BUTTON 23</ledcontrol.h></ofrobotdfpleyermini.h></softwareserial.h></arduino.h>
// for RGB light (pin:31-51) int mdPin; int mdPin; int graenPin; int planePin; int bluePin; int bluePin; int mdValue; int graenValue; int graenValue; int blueValue; // for eyes (pin:51) int DN = 11; int DN = 11; int DN = 8.00; int CLK = 9;
int buttonFlag = 0;
LacE_cord year = LacE_c
B00000000, B00000000, B00000000, B00000000
int colorRed(){ redValue = 255; greenValue = 0; blueValue = 0; }
int colorPink(){ redValue = 255; greenValue = 20; blueValue = 187; }
int colorOrange()(redValue = 180; greenValue = 120; blueValue = 0; }
int colorYellow(){ redValue = 255; greenValue = 215; blueValue = 0; }
int colorGreen(){ redValue = 0; greenValue = 255; blueValue = 0; }
int colorBlue(){ redValue = 85; greenValue = 105; blueValue = 255;

```
colorRed();
analogWrite (redPin,
                                                                           redValue);
analogWrite (greenPi
                                                                          greenValue);
analogWrite (bluePin
                     oin:9-11)
                                                                           blueValue);
                                                                                delay(100);
                                                                               redPin = 34;
greenPin = 35;
bluePin = 36;
                     ag = 0;
                                                                          colorOrange();
analogWrite (redPin,
redValue);
analogWrite (greenPin
greenValue);
                    eyes =
(DIN,CLK,CS,1);
                                                                          analogWrite (bluePin,
blueValue);
                      eutral(8)={
                                                                               delay(100);
                                                                                redPin = 37:
                                                                               greenPin = 38;
bluePin = 39;
                                                                               colorYellow();
analogWrite (redPin,
                                                                           redValue);
analogWrite (greenP
                       ppy[8]={
                                                                           greenValue);
analogWrite (bluePin.
                                                                           blueValue):
                                                                               delay(100);
                                                                                redPin = 40;
                                                                               greenPin = 41;
bluePin = 42;
                     deep(8)={
                                                                               colorGreen();
analogWrite (redPin,
                                                                          redValue);
analogWrite (greenP
                                                                          greenValue);
analogWrite (bluePin
                                                                           blueValue):
                                                                               delay(100);
                     }=(8)th
                                                                                redPin = 43;
                                                                               greenPin = 44;
bluePin = 45;
                                                                               colorBlue();
analogWrite (redPin,
                                                                         redValue);
analogWrite (greenPir
greenValue);
analogWrite (bluePin,
                                                                           blueValue):
                                                                               delay(100);
                     (){
= 255;
ue = 0;
e = 0:
                                                                              redPin = 46;
greenPin = 47;
bluePin = 48;
colorPurple();
analogWrite (redPin,
                                                                          redValue);
analogWrite (greenPir
greenValue);
                    k(){
= 255;
ue =20;
p = 187;
                                                                           analogWrite (bluePin,
blueValue);
                                                                               delay(100);
                                                                                redPin = 49;
                    inge()(
= 180;
lue = 120;
                                                                               greenPin = 50;
bluePin = 51;
                                                                                 colorPink();
                                                                           analogWrite (redPin,
redValue);
analogWrite (greenPi
                                                                          greenValue);
analogWrite (bluePin
                    low(){
= 255;
lue = 215;
e = 0;
                                                                           blueValue):
                                                                               delay(100);
                                                                          int lightoff (){
for(int) = 0; i < 7; i += 1
redPin = 31 + i*3;
greenPin = 32 + i*3;
bluePin = 33 + i*3;
analogWrite (ordePin,
analogWrite (greenPin
analogWrite (bluePin,
delay(10);
                    ren(){
e = 0;
lue = 255;
e = 0;
                    20{
= 65;
ue = 105;
e = 255;
int colorPurple()(
```

	myDFPlayer; void printDetail(uint8_t type, int value);
in,	# grays nested of open nested for(nein = 0.05.**) for(nein = 0.05.**)
in,	void nightlight() { for(int i = 0; i < 4; i = 1) { redPin = 31 + i*3; greenPin = 32 + i*3; bluePin = 33 + i*3; analog/Write (redPin, 255);
	analogWrite (greenPin, 255); analogWrite (bluePin, 255); delay(100); } forcint i = 0: i < 2: i += 1) {
in,	for(int i = 0; i < 2; i ** 1) { redPin = 46 * i*3; greenPin = 47 * i*3; bluePin = 48 * i*3; analogWitte (redPin, analogWitte (greenPin, 255); analogWitte (bluePin, 255); analogWitte (bluePin, 255);
in,	255); delay(100); } delay(3000); eyesOff(); }
in,	void silam() { in district silam i franç in
in,	lightoff(); eyeaHappy(); myDFPlayer,play(3); //play 'good job Hist brush your tooth together0'; delay(4000); eyeaNeutral();]
1) { 0); in, 0); , 0);	void timen() { int time(State = true; while (time(State = true) { String state; while (Serial available()) { delay (10; state = r. Gerial read(); state = r. Gerial read(); if (state = rotone'); if (state = rotone'); break; break; }

SoftwareSerial mySoftwareSerial(13, 12); // RX, TX

DFRobotDFPlayerMini

redValue = 145; greenValue = 88; blueValue = 255;

// for light

int rainbow(){ redPin = 31;

greenPin = 32; bluePin = 33;

) moDERinar on moO:	
	if (
myor Player.pause();	(but
myDFPlayer.pause(); eyesHappy(); myDFPlayer.play(5); /play "Good job! brush your tooth"	
/play "Good job! brush your tooth"	b
	d
delay(3000); rainbow();) (
rainbow();	(but
rainbow();	(DO
lightoff(); rainbow(); lightoff();	
eyesNeutral();	
delay(5000);	
myDFPlayer.play(33): //pl	
delay(5000); eyesHeppy(); myOFPayer.play(33); #pl ay "its time for school" delay(2000); eyesNeutral();	red
delay(2000);	
eyesNeutral();	gree
1	blue
void setup()	
{)
// setup SD-card mySoftwareSerial.begin(96 00);	í
00)	3
Serial begin(115200);	
Serial.begin(9600);	voic {
// Serial printin/F(*DFRobot	1 8
DFPlayer Mini Demo"));	- 6
// Senal.println(F("Initializing	
Serial begin(9500); // Serial printin(); // Serial printin(); // Serial printin(P("DFRobot DFPlayer Min Demo")); // Serial printin(P("Initializing DFPlayer(Mey take 3~5 seconds)"));	
seconds))),	}
(ImyDFPlayer.begin(mySoft wareSerial)) { //Use softwareSerial to	
wareSerial)) { //Use	0
softwareSerial to	if if
Codel adeta/E/III techtore	rout
Senal, printing (* Orlader to begin**)); Senal, printin(F(*1, Please racheck the connection!**)); Senal, printin(F(*2, Please insent the SD card!*)); sehild(rint);	idu
Serial.println(F(*1,Please	
recheck the connection!"));	//pla
Serial.println(F("2.Please	
	11 9
} Serial.println(F(*DFPlayer Mini online.*));	
Serial.println(F(*DFPlayer	3
Mini online.")); myDFPlayer.volume(30); // Set volume value. From 0 to	1
myDFPlayer.volume(30); // Set unlume value, Erem 0 to	
myDFPlayer.setTimeOut(50 0); //Set serial	play
0); //Set serial	
communication time out 500ms	{ 8
myDEPlayer FOIDEPLAYE	1 0
R EQ NORMAL);	
myDFPlayer.outputDevice(play
myDFPlayer,EQ(DFPLAYE R_EQ_NORMAL); myDFPlayer.outputDevice(DFPLAYER_DEVICE_SD);	play
myDIPlayer.outputDevice(DFPLAYER_DEVICE_SD);	play
	3
	play bac
Serial.printfn(myDFPlayer.r eadState()); #read mp3 state Serial.printfn(myDFPlayer.r	3
Serial printfn(myDFPtayer.r eadState()); //read mp3 state Serial printfn(myDFPtayer.r eadVolume()); //read ourrent	3
Serial printfn(myDFPtayer.r eadState()); #read mp3 state Serial printfn(myDFPtayer.r eadVolume(); #read ourset	3
Serial printfn(myDFPtayer.r eadState()); #read mp3 state Serial printfn(myDFPtayer.r eadVolume(); #read ourset	3
Serial printfn(myDFPtayer.r eadState()); #read mp3 state Serial printfn(myDFPtayer.r eadVolume(); #read ourset	} bec
Serial printfn(myDFPtayer.r eadState()); #read mp3 state Serial printfn(myDFPtayer.r eadVolume(); #read ourset	} bed
Serial printfn(myDFPtayer.r eadState()); #read mp3 state Serial printfn(myDFPtayer.r eadVolume(); #read ourset	} bed
Serial printfn(myDFPtayer.r eadState()); #read mp3 state Serial printfn(myDFPtayer.r eadVolume(); #read ourset	} bec
Serial prindri(myDFPlayer.r eadState()), Pread imp3 state Sarial prindri(myDFPlayer.r eadState()), Pread ormor state Sarial prindri(myDFPlayer.r eadEQD), Pread ormor statume Sarial prindri(myDFPlayer.r eadEQD), Pread of all eader ead ormor ead of ead of ead ormor ead of ead of ead or ead of	//p
Sarial prind r(myQFPlayer, eardSteel()), if read myS issues Sarial prind(myQFPlayer, ead/victum()), if read current victum prind(myPlayer, ead/victum()), if read current victum prind(myQFPlayer, eadf-e()), if read SES sarial prind(myQFPlayer, eadf-e(Scure()), if read all sarial prind(myQFPlayer, eadf-e(Scure()), if read all sarial prind(myQFPlayer, eadf-ercored), if read all sarial prind(myQFPlayer, eadf-ercored), if read automotion by the	//p
Sarial prind r(myQFPlayer, eardSteel()), if read myS issues Sarial prind(myQFPlayer, ead/victum()), if read current victum prind(myPlayer, ead/victum()), if read current victum prind(myQFPlayer, eadf-e()), if read SES sarial prind(myQFPlayer, eadf-e(Scure()), if read all sarial prind(myQFPlayer, eadf-e(Scure()), if read all sarial prind(myQFPlayer, eadf-ercored), if read all sarial prind(myQFPlayer, eadf-ercored), if read automotion by the	//p
Sarial prind r(myQFPlayer, eardSteel()), if read myS issues Sarial prind(myQFPlayer, ead/victum()), if read current victum prind(myPlayer, ead/victum()), if read current victum prind(myQFPlayer, eadf-e()), if read SES sarial prind(myQFPlayer, eadf-e(Scure()), if read all sarial prind(myQFPlayer, eadf-e(Scure()), if read all sarial prind(myQFPlayer, eadf-ercored), if read all sarial prind(myQFPlayer, eadf-ercored), if read automotion by the	//p
Sarial print niny(DFP) layer resClate(1); if nead mois state state (1); if nead mois state reschied (1); if nead mois state each (2) if nead correct volume Sarial print niny(DFP) layer, state print niny(DFP) layer each (2); if nead all file counts (1); if nead (1); i	//p
Sanid prindrighty GP Players essStead), fined mob state Senid prindrighty Players essStead, prindrighty Players essStead, prindrighty Players essStead, prindrighty Players essSt. Qpl. read Ed setting Senid prindrighty Players essSt. Qpl. read Ed setting Senid prindrighty Players essCurrer(fieldwinder); file counts in SQ and Senid prindrighty Players essCurrer(fieldwinder); file counts file of the Senid prindrighty Senid prindrighty Players Senid prindrighty Players Senid prindrighty Players Senid prindrighty Players	//p
Serial printfrictyOFP bywer eastSteld(), Prival myb stell east series and the prival myb stell east series and the prival myb stell east series and the prival myb series and	//p
Serial printfrictyOFP bywer eastSteld(), Prival myb stell east series and the prival myb stell east series and the prival myb stell east series and the prival myb series and	//p
Serial printfrictyOFP bywer eastSteld(), Prival myb stell east series and the prival myb stell east series and the prival myb stell east series and the prival myb series and	//p
Serial printfrictyOFP bywer eastSteld(), Prival myb stell east series and the prival myb stell east series and the prival myb stell east series and the prival myb series and	//p
Serial print formyOFP bywer earStee(i), Prined myD state Serial print form of the state Serial print form of the state Serial print form of the state volume volume print formyOFP bywer serial CQI), Print GE stating Serial print formyOFP bywer serial print formyOFP bywer form of the state of the state Serial print formyOFP bywer form of the state of the state form of the state of the number of number of numbe	//p
Sarial printfo(ny)GPP byear earthse(i), fined mp3 state Sarial printfo(ny)FP byear earthse(i), fined mp3 state Sarial printfo(ny)FP byear earthse(i), fined course Sarial printfo(ny)FP byear earths(i), fined course for earthse(i), fined course for earthse(i), fined course for earthse(i), fined all file course in SO gard file course in SO gard earthse(i), fined course for file for earthse(i), fined course for file for earthse(i), fined file course in Today SO(3), fined file course file for earthse(i), fined file course file file file file file file file fil	//p
Sarial printfo(ny)GPP byear earthse(i), fined mp3 state Sarial printfo(ny)FP byear earthse(i), fined mp3 state Sarial printfo(ny)FP byear earthse(i), fined course Sarial printfo(ny)FP byear earths(i), fined course for earthse(i), fined course for earthse(i), fined course for earthse(i), fined all file course in SO gard file course in SO gard earthse(i), fined course for file for earthse(i), fined course for file for earthse(i), fined file course in Today SO(3), fined file course file for earthse(i), fined file course file file file file file file file fil	//p
Sarial printfo(ny)GPP byear earthse(i), fined mp3 state Sarial printfo(ny)FP byear earthse(i), fined mp3 state Sarial printfo(ny)FP byear earthse(i), fined course Sarial printfo(ny)FP byear earths(i), fined course for earthse(i), fined course for earthse(i), fined course for earthse(i), fined all file course in SO gard file course in SO gard earthse(i), fined course for file for earthse(i), fined course for file for earthse(i), fined file course in Today SO(3), fined file course file for earthse(i), fined file course file file file file file file file fil	
Serial printfricty()FPlayers eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 eachteid(), fived eachteid(), fiv	lipping and playing pl
Serial printfricty()FPlayers eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 eachteid(), fived eachteid(), fiv	//pbaco
Serial printfricty()FPlayers eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 stee eachteid(), fived mp3 eachteid(), fived eachteid(), fiv	lipping and playing pl
Serial print(e/myCFP) bywer excelled (ii), fined mp3 state Serial print(e/myCFP) bywer excelled (iii), fined mp3 state Serial print(e/myCFP) bywer and serial print(e/myCFP) bywer and serial print(e/myCFP) bywer excelled (iii), fined all serial print(e/myCFP) bywer excelled (iii), fined (ii	## become ## bec
Serial print(e/myCFP) bywer excelled (ii), fined mp3 state Serial print(e/myCFP) bywer excelled (iii), fined mp3 state Serial print(e/myCFP) bywer and serial print(e/myCFP) bywer and serial print(e/myCFP) bywer excelled (iii), fined all serial print(e/myCFP) bywer excelled (iii), fined (ii	## become ## bec
Serial printfr(myCPP) syear earCites(i); if weld myD state earCites(ii); if weld myD state earCites(iii); if weld myD state earCites(iii); if weld myD state earCites(iii); if weld carrier, without earCites(iii); if well earCites(iiii); if well earCites(iiii); if well earCites(iiiiii); if well earCites(iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	//pbaco
Serial print(e/myCFP) bywer excelled (ii), fined mp3 state Serial print(e/myCFP) bywer excelled (iii), fined mp3 state Serial print(e/myCFP) bywer and serial print(e/myCFP) bywer and serial print(e/myCFP) bywer excelled (iii), fined all serial print(e/myCFP) bywer excelled (iii), fined (ii	
Serial printfr(myCPP) syear earCites(i); if weld myD state earCites(ii); if weld myD state earCites(iii); if weld myD state earCites(iii); if weld myD state earCites(iii); if weld carrier, without earCites(iii); if well earCites(iiii); if well earCites(iiii); if well earCites(iiiiii); if well earCites(iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	
Serial printfr(myCPP) syear earCites(i); if weld myD state earCites(ii); if weld myD state earCites(iii); if weld myD state earCites(iii); if weld myD state earCites(iii); if well and current volume earCites(iii); if well and current earCites(iii); if well and iii); if well and iii) and iii	
Serial printing/py(IPP) byear a earStead(I), fineed mp3 state is Serial printing/PyP-Bryaver a serial printing/PyP-Bryaver a serial printing/PyP-Bryaver a serial printing-III fined control c	
Serial prind richy (IPP) layers eastState(I), if head myb state eastState(I), if head myb state eastState(I), if head myb state eastState(II), if head myb state eastState(II), if head carrier, sold-partial eastState(II), if head carrier, sold-partial eastState(II), if head carrier, sold-partial east-partial east-par	
Serial printing/py(DFP) byear a earStead(), fined mp3 state serial printing/PFP byear a serial printing/PFP byear a serial printing/PFP byear a serial printing-py(FPP) byear a serial printing-py(FPP) byear a serial printing-py(FPP) byear and serial printing-py(FPP) byear and serial followed (), referred that serial followed (), referred that serial printing-py(FPP) byear and serial followed (), referred that serial printing-py(FPP) byear and consideration of the serial printing-py(FPPP) byear and consideration of the serial printing-py(FPPP) byear and consideration of the serial printing-py(FPPPP) byear and consideration of the serial printing-py(FPPPP) byear and consideration of the serial printing-py(FPPPPPPPP) byear and consideration of the serial printing-py(FPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP	
Serial printing/py(DFP) byear a earStead(), fined mp3 state serial printing/PFP byear a serial printing/PFP byear a serial printing/PFP byear a serial printing-py(FPP) byear a serial printing-py(FPP) byear a serial printing-py(FPP) byear and serial printing-py(FPP) byear and serial followed (), referred that serial followed (), referred that serial printing-py(FPP) byear and serial followed (), referred that serial printing-py(FPP) byear and consideration of the serial printing-py(FPPP) byear and consideration of the serial printing-py(FPPP) byear and consideration of the serial printing-py(FPPPP) byear and consideration of the serial printing-py(FPPPP) byear and consideration of the serial printing-py(FPPPPPPPP) byear and consideration of the serial printing-py(FPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP	
Sarial printfor(nyOFP) syeur earStea(I), fined myb state serial printfor(nyOFP) syeur earStea(I), fined myb state serial printfor(nyFP) syeur ears serial printfor(nyOFP) syeur ears serial printfor(nyOFP) syeur ears serial printfor(nyOFP) syeur ears serial printfor(nyOFP) syeur ears serial syeur ears	
Serial prind richy (IPP) layers eastState(I), if head myb state eastState(I), if head myb state eastState(I), if head myb state eastState(II), if head myb state eastState(II), if head carrier, sold-partial eastState(II), if head carrier, sold-partial eastState(II), if head carrier, sold-partial east-partial east-par	

if ((buttonState == 0) &&	
(buttonFlag == 0)) {	myDFPlayer.play(19); //play "it's already been 20
lightoff();	
(buttonFlag == 0)) { lightoff(); myOFPlayer.pause(); buttonFlag = 1; delay(f());	minites" deley(2500); eyeshlappy(); myOFPleyer.pley(21); //play "Let's grab a snack" deley(2000); eyesNeutral();
delay(80);	evesHappy():
) else (myDFPlayer.play(21);
if ((buttonState == 0) &&	//play "Let's grab a snack"
(buttonFlag == 1)) {	delay(2000);
nightlight();	
redPin = 43; greenPin = 44; bluePin = 45;	//bedtime delay(5000); //weit until
greenPin = 44;	delay(5000); //weit until
bluePin = 45;	bedtime
analogWrite (redPin, redValue):	bectime eyesHappy(); myDFPlayer.play(23); ((r)ex "You pompleted all
analogWrite (greenPin,	//play "You completed all your tasks! Now you can pick
greenValue); analogWrite (bluePin,	your tasks! Now you can pick
analogWrite (bluePin,	a color!" delay(4500);
blueValue); myDFPlayer.loop(41);	evesNeutral():
buttonFlag = 0;	} else if (state == "red") { // GOOD
delay(80);	
	eyesHappy(); myDFPlayer.play(25); //play "Greet choice!" delay(1500);
j	Inlay "Greet chrine!"
, ,	delay(1500):
	lightoff();
void loop()	rainbow();
Strong state:	lightoff(); redPin = 43;
String state; while (Serial.available()) {	greenPin = 44; bluePin = 45;
delay (10):	bluePin = 45;
char c = Serial read():	colorRed(); analogWrite (redPin,
state •= c;	analogivinte (redinin, redValue);
}	analonWrite (preenPin
# marriag routing	analogWrite (greenPin, greenValue); analogWrite (bluePin,
// moming routine if (state_length()>0) { if (state == "morning	analogWrite (bluePin,
if (state == "morning	
routine*) { // GOOD	delay(2000);
if (state = "morning if (state = "morning routine") { // GOCD eyeshleppy(), myOFPlayer_play(1); //play "Good morning"	delay(2000); myDFPlayer.play(27); // play "Good night!" delay(1900); eyesSleep(); platticht);
myDFPlayer.play(1);	delay(1500):
//play "Good morning" delay(1800); myDFPlayer.loop(37); // play alarm	eyesSleep();
muDEPlaner Inco (37):	
// play alarm) else if (state == "Orange") { // GOOD
	eyesthappy(); myDFPlayer.play(25); //play*Great choice!* deley(1500); rainbow();
} else if (state == "yes")	myDFPlayer.play(25);
{ // GOOD	//play "Great choice!"
eyesNeutral();	delay(1500);
myOFPlayer.pause(); myDFPlayer.loop(39); // play music for brush tooth	rainbow(); lightoff();
play music for brush tooth	
timer();	lightoff():
timer();) else if (state == "bye") { // GOOD	lightoff(); redPin = 43;
{ # GOOD	
eyesHappy();	bluePin = 45; colorOrange();
ayasHappy(); myOPPlayer,play(35); # play "good bye" delay(1800); delay(3000); ayasOff();	analogWrite (redPin,
delay(1800):	recValue):
delay(3000);	redValue); analogWrite (greenPin,
eyesOff();	greenValue); analogWrite (bluePin,
} else if (state == "hi fm beok") { // GOOD	
back") { // GOOD rainbow();	delect 2000)
	myDFPlayer.play(27);
rainbow();	
rainbow(); lightoff(); evesHappy();	// play "Good night!"
rainbow(); lightoff(); eyesHappy(); myDFPlayer.play(9);	// play "Good night!" delay(1500);
raincow(); lightoff(); eyeshtappy(); myOFPlayer.play(9); //play "I'm glad you're back"	// play "Good night!" delay(1500); eyes5leep(); ejes5leep();
raindow(); lightoff(); eyesiteppy(); myDFPlayer.play(9); //play "I'm glad you're back" delay(2000);	// play "Good night" delay(1500); eyesSleep(); nightlight();) else if (state == "vellow")
raindow(); lightcff(); eyestrappy(); myDFPlayer.play(9); //play "I'm glad you're back" claly(2000); eyest/eutml();	// play "Good night" delay(1500); eyesSleep(); nightight();) else if (state == "yellow") { // GOOD
lightoff(); eyesif-tapoy(); myDFPlayer.play(9); //play**Im-glad you're-back** delay(2000); eyesif-(sutate) == "romind me") * // GOOD	
lighteff(); eyes/tappy(); myDFPlayer.play(9); myDFPlayer.play(9); //play*Tim_glad you're back* delay(2000); eyes/keutni();) else if (state == "remind me"){ // GOOD messet tempor(): // second)	// play "Good night" deley(1500); eyesSleep(); nightlightl); } else if (state == *yellow*) { // GCOD eyesHippp(); myDFPlayer.play(25);
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19); n 20	analogWrite (redPin,
n 20	redValue); analogWrite (greenPin,
	greenValue):
21);	analogWrite (bluePin,
ack*	blueValue); delay(2000); myDFPlayer,play(27); // play "Good night" delay(1500); eyesSleep(); nightight(); } else if (state == "blue") // (CADD)
	myDFPlayer.play(27);
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it until	eyesSleep();
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all n pick	eyesHappy(); myDFPI eyer.play(25); //play "Great choice!" delay(1500); rainbow(); [shtwff)*
n pick	//play "Great choice!"
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9	rainbow(); lightoff(); redPin = 43;
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ange*)	rainbow():
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	greenValue); analogWrite (bluePin,
	blueValue); delay(2000); myDFPlayer.play(27); // play "Good night!"
in,	mvDFPlaver.plav(27):
nPin,	// play "Good night!"
Pin.	delay(1500); eyesSleep();
	nightlight();
27);) else if (state == "pink") { // GOOD
- "	eyeshappy(); myDFPlayer.play(25); //play "Great choice!" delay(1500);
	myDFPlayer.play(25); //olay "Great choice!"
	delay(1500);
low*)	rainbow(); lightoff();
25);	lightoff(); rainbow();
	lightoff(); redPin = 43;
	redPin = 43; greenPin = 44:
	greenPin = 44; bluePin = 45;
	colorPink(); analogWrite (redPin,
	analogWrite (greenPin, greenValue);
in,	
nPin,	delay(2000):
	analogWinte (bluePin, blueValue); delay(2000); myDFPlayer,play(27); // play "Good right" delay(1500); eyesSieep(); nightlight();
Pin,	// pray "Good night!" delay(1500):
	eyesSleep();
27);	nightlight();
)
	state = ""; touchsensor();
en")	touchsensor(); // if (firstTime == 0) // { eyesHappy(); firstTime =
	<pre>// { eyesHeppy(); firstTime = 1; }</pre>
25)-	1



