

এখানে ফুলিয়ার বিখ্যাত  
শাড়ী পাইকারী দরে বিক্রি  
সব রকম শাড়ী ও শাল তাত প  
৩৮/২৩ গড়িয়া হাট রোড, কলি

ಬಿ.ಕೆ. ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

10 ಸೆ ಅಡ್ಡರನ್  
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ಬೆಂಗಳೂರು ಬಾಡ್ E: 150

Super TAILORS A/c

சர்ட்டைட்

குப்பர்

டெய்லர்ஸ்

கோட்டக்கல்

இறிய வலத்திய சாலை

Super

குப்பர்

**சாஊபுறால**  
**செஸ்ஸப்பா** உயர்தர சைவ உ

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ଉତ୍ତମ  
କୁମାର  
ଥାପ୍ପା  
ଶକ୍ତିଗଡ଼  
୧୨୯୪  
ବର୍ଧମାନ  
ଲାଲ ବାହାଦୁର ଶାସ୍ତ୍ରୀ ମହଲ

শ্রী বুদ্ধদেব উদ্যাল গঙ্গা  
স্থাপিত - ১৯৯৬  
শ্রী-জামোদা পাহাড়  
না- বাঘমুন্ডি, পুন্ডি  
ফোন - ৭৪৬১৬২  
জি: নং -

ગુજરાતની અસ્મિતાનો નવો ધબકાર...

**મોનિટર**

૨૧મી સદીનું મેગેઝીન



ಕರ್ನಾಟಕ ಸರ್ಕಾರ  
ಬೌದ್ಧೋದ್ಧಾರ ಪ್ರವೇಶ  
ತಲಕಾಡು  
ಮರಳು ಸಾಗಿಸುವುದನ್ನು ನಿಷೇಧಿಸಿದೆ  
ಕಾನೂನು ಉಲ್ಲಂಘಿಸಿದರೆ  
ಶಿಕ್ಷೆಗೆ ಗುರಿಪಡಿಸಲಾಗುವುದು





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టెట్రాసెఫ్టర్ముఖ-ఈఎబ్బుమ=Vఫుడ

કુઓએઔલબપભઞઓખઇલૃધનકુ

কআখটবাজছপ্পাঔখগঘতবাপ্পাউছনহঔবন

# ಟೀ:ಇಾರ್ಪುನಚಡ

# What are these?

ਐਓਐਕਠੜਉਐਖਘਛਈਚਛੜਓਅਆਇ

# ഓപ്പറേഷൻ

ପଞ୍ଚୋଦୟଦିବସ

ஆளுக நட்சஜ்ஞ்ஞ ஒஹத்

[illegible]

# ಟೀಃಇಾರ್ಢನಚಡ

ਐਓਐਕਠੜਉਐਖਘਛਈਚਛੜਓਅਆਇ

# ഓപ്പൺഘട്ടം

ପଞ୍ଚୋଦୟଦିବସ

# ஆளுக நட்சஜ்ஞ்ண ஒஹத்

It is **SAD** that we still call them as  
'JALEBIS', '*CHAKALIS*' &  
Not by **Language Script Name**

# Why so?

BECAUSE WE CAN HARDLY  
RECOGNISE ANY...





# Designing a Touch Based Application Game to Recognise *Gujarati* Script for Children

## PROJECT - 2

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Guided by:  
**Prof. Mandar Rane**

Submitted by:  
**Vishnupriya Kaulgud**  
Visual Communication  
126250002

2012 - 2014  
**IDC IIT Bombay**



# SCRIPT Recognition Test among 25 People!

Write the script name below:

Your Name:

అటవీ సురక్షం మరియు వనరుల సంరక్షణ

ફો.એ.એલ.બ.પ.ભ.મ.ઓ.ખ.ઇ.લ.ધ.ન.ફ.જ.ઉ.ણ.ખુ.ઐ.ક્ષ.ખ.ણ.કુ.ગ્ર.શ.ઝ

কআখটবাজছাঔখগঘতবাম্বাউছনহঔবনপ্লান্টন্দদ্য

ಟೀಃಇರುನಚಡಟೀಃಇರುನಚಡಮೂಘಲಮೂಘ

ਐਓਐਕਠੜਉਐਖਘਛਈਚਛੜਓਅਆਇਵਐਓਐਕਠੜਉਐਖ

ഓഷ്ഠബലമുണ്ടാകട്ടെ

ପଞ୍ଚୋଦନଦ୍ରବ୍ୟର ପଞ୍ଚୋଦନଦ୍ରବ୍ୟର ପଞ୍ଚୋଦନଦ୍ରବ୍ୟର ପଞ୍ଚୋଦନଦ୍ରବ୍ୟର ପଞ୍ଚୋଦନଦ୍ରବ୍ୟର

ஆலோகங் சஜ்ஞ ஓஹத் ஆலோகங் சஜ்ஞ



# Test Results

- Non of the users among 25 tested could recognise all these scripts correctly.

## Statistics:

```
2 users got 6 correct
3 users got 4 correct
4 users got 3 correct
6 users got 2 correct
5 users got 1 correct
5 users got 0 correct
```

[illegible][illegible]

# Test Results

- Non of the users among 25 tested could recognise all these scripts correctly.
- This tells us that very few people know to recognise all the scripts correctly.

## Statistics:

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```

Your Name: \_\_\_\_\_ Write the script name below

ಅಬಲಸಪಫಯುಖಕುವಯುಮವಽvಘಟಕರುಧಿ

কআখঠটবাজছঋঔখগঘতবাঝউছনংঔবনজ্ঞল্টন্দক্ষ Bengali

ಟಆঃಇಯ್ಯನಚೆಡಟಆঃಇಯ್ಯನಚೆডমೂಫಲಮೂಳ

အိဇာဝံကစဒုဗ္ဗိအိဃယဇာငါးဇဉ်ဇအါအါဗိဇအိဇာဝံကစဒုဗ္ဗိဗ္ဗိ Guemukhi

ഓഐഎങാലഉണഓഐഎങാലഉഐനഏലല്ലൻ Tamil

വഴിംഭനമരംതരമെലവഴിംഭനമരംതരമെലവരെ

ஆஊகஙசஜஞணஒஹதஆஊகஙசஜஞண Malayalam

[illegible]

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[illegible][illegible]



# Test Results

- Non of the users among 25 tested could recognise all these scripts correctly.
- This tells us that very few people know to recognise all the scripts correctly.
- Maximum people didn't even knew the names of these scripts.
- After solving this task, they were eager to know the correct answer and felt bad that they couldn't recognise any.

## Statistics:

```
2 users got 6 correct
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[illegible][illegible]

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- India has 22 official languages and 13 official scripts in which 9 are major scripts.



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- People speak the language but fail to identify the associated script.



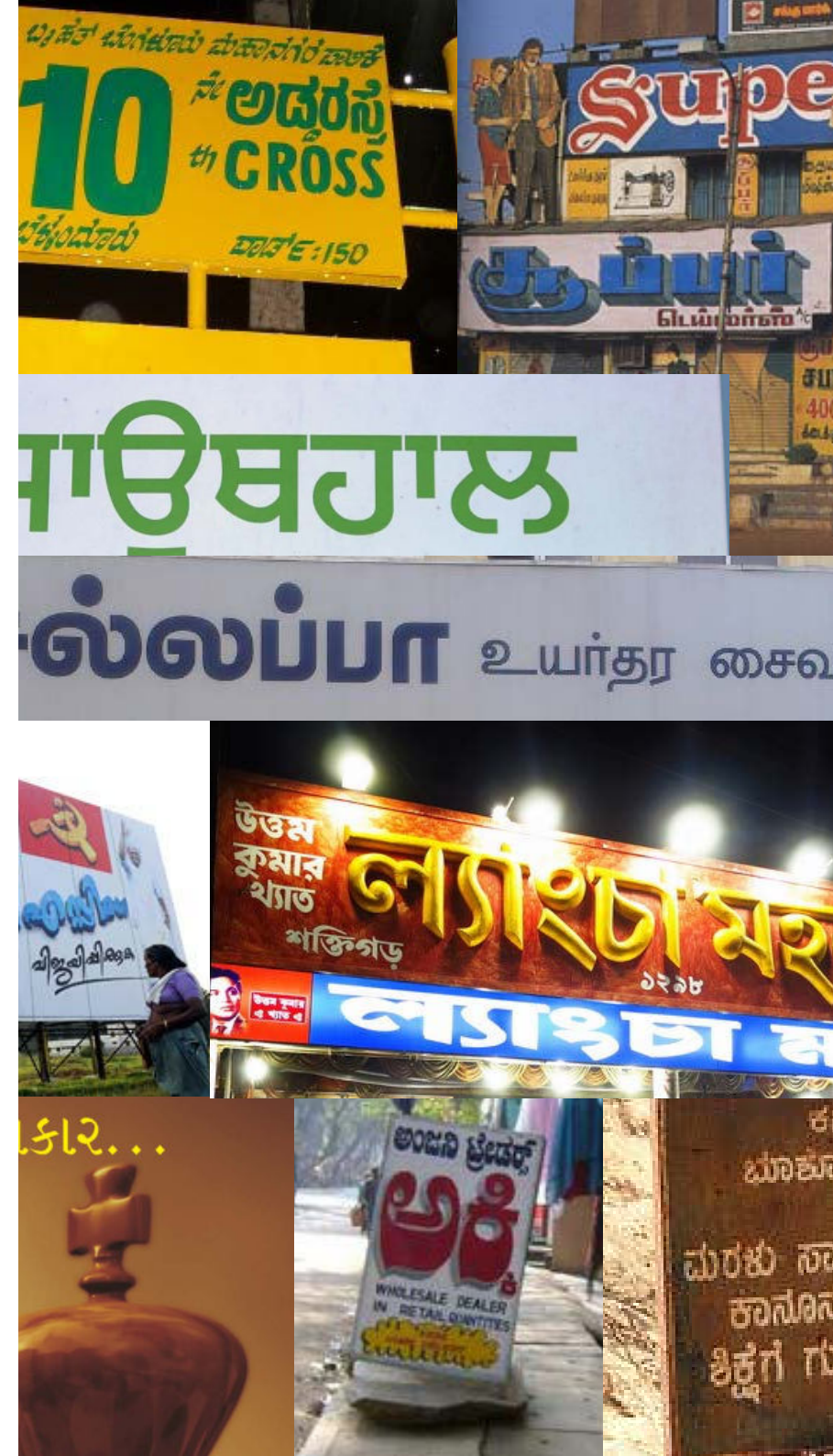
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- Very few Indians can read more than three different language scripts (first language, second language, regional language).
- People speak the language but fail to identify the associated script.
- This is a crucial problem and if one could recognise a script in early childhood, it would be beneficial.



# What is the need?

- When one travels to a different state, there is a new language spoken and supporting script used for reading and writing in India. But one is unable to identify these scripts.
- It would be useful if one can identify and read at least one new Indian script apart from what is learnt in schools.



# Why *Gujarati* script?

- India is a country rich with diversity of 22 official languages spoken, 13 official scripts and 9 major scripts. The initial aim was recognising all these scripts. For achieving this, it was required to learn each script technically.
- Considering the time constrain, the best way was to develop a technique for one script in such a way that the same technique can be used for recognition of other scripts.

Bengali অ	Gujarati અ	Oriya ଅ
Gurumukhi ਅ	Devanagari अ	Tamil அ
Kannada ಅ	Telugu ఆ	Malayalam അ



- The majority of languages in India uses *Devanagari* as their script. It was hence chosen as a native language script of the users.
- It is also known script to me thoroughly.
- To choose one among nine major scripts, four scripts were short-listed initially which were *Bengali*, *Gujarati*, *Tamil* & *Kannada*.



- As *Gujarati* script letter-forms are more similar to *Devanagari* script, it would be convenient to develop a system initially. Hence, the selection of *Gujarati* script.
- I took this script only to start with. This system of recognition can be later developed for other scripts too.



# Devanagari Letter-forms

Vowels

अ आ इ ई उ ऊ ए ऐ ओ औ अं अः

Consonants

क ख ग घ ङ च छ ज झ ट ठ ड ढ ण

त थ द ध न प फ ब भ म य र ल

व श ष स ह ळ क्ष ज्ञ

Numbers

० १ २ ३ ४ ५ ६ ७ ८ ९

# Gujarati Letter-forms

## Vowels

અ આ ઇ ઈ ઉ ઊ ઋ ૠ ઐ ઒  
ઔ અં અઃ અँ

## Consonants

ક ખ ગ ઘ ઙ ચ છ જ ઝ ઞ ટ ઠ ડ  
ઢ ળ ત થ દ ધ ન પ ફ બ ભ મ ય  
ર લ વ શ ષ સ હ ળ ક્ષ જ્ઞ

## Numbers

૦ ૧ ૨ ૩ ૪ ૫ ૬ ૭ ૮ ૯

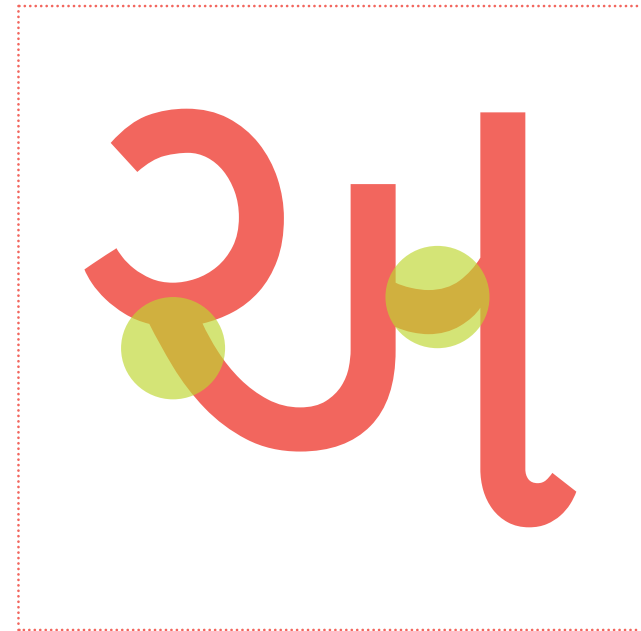


# Problem Statement

Recognition of **Gujarati** script for children.

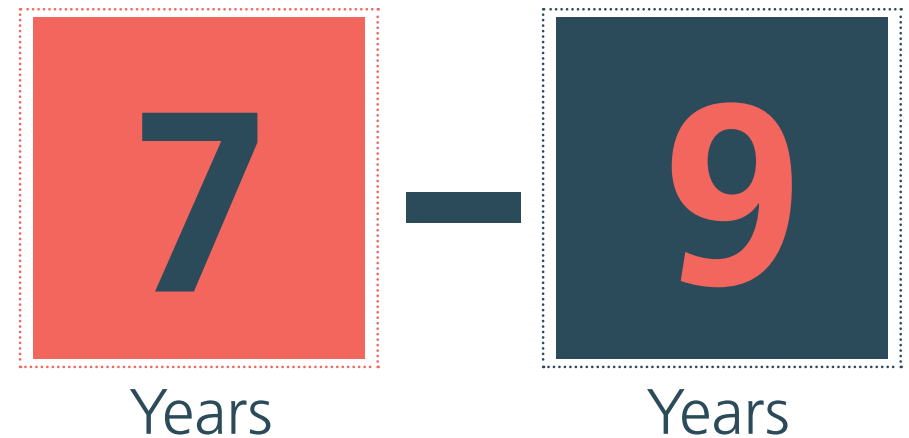
By the solution of this project, following are the things that a child will come to know about a script:

- Alphabet Recognition
- Letter Shape Recognition
- Letter-Sound Association
- Rapid-Letter Naming



# Users

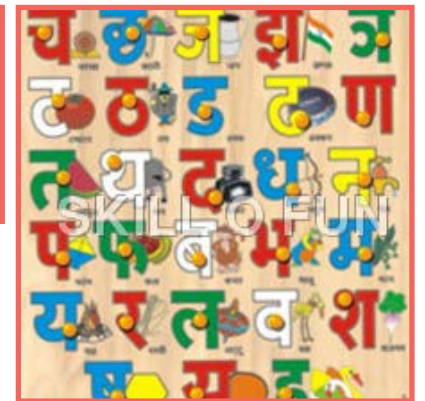
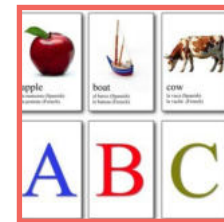
- For this project, it is necessary for a child to know *Devanagari* script completely.
- The age group selected initially for the study was 4-5.5 years old pre-primary school kids. By this age they start learning *Devanagari* script but may not know it properly.
- So the age group has been increased to 7-9 years old children who knows *Devanagari* script. By this age they would know to recognise, write & construct words in *Devanagari*.
- A child may know or may not know to speak *Gujarati* language.



# DATA COLLECTION

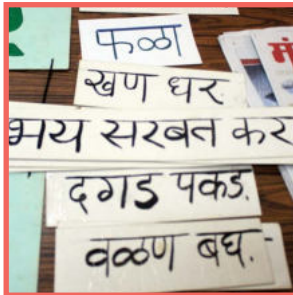
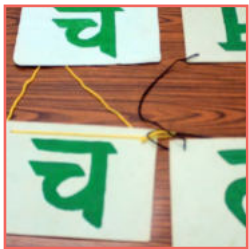
## DATA COLLECTION

- Teaching methods in English medium  
'Kendriya Vidyalaya'  
Kindergarten School



- Day Care  
'Shishuvihar'
- Activities related to learning.

- Teaching methods in Marathi medium pre-primary school: *'Abhinav Shikshan Prasarak'*, Goregaon



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## DATA COLLECTION

- Games related to recognition, memorising. (Digital games, board games)



- Day Care '*Shishuvihar*'
- Activities related to learning.

# Intended Goal

A Child should RECOGNISE  
'Gujarati' Script which includes  
Vowels, Consonants & Numbers  
&  
NOT Conjuncts, Writing of the Script.

## Primary Goals:

- Learn *Gujarati* script
- Learn the writing manner, vowels, consonants of *Gujarati*
- Decide the medium of design
- Memorizing activities
- To learn Playful methods to learn the script

## Primary Goals:

- Learn *Gujarati* script
- Learn the writing manner, vowels, consonants of *Gujarati*
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- To learn Playful methods to learn the script

## Secondary Goals:

- EXECUTION:
- Book Design: Compilation of two language script in a book in a story-form or picture depiction
- Game Design: A game which will teach Gujarati is easiest and playful way. Board game or digital game.
- Visual Design of the Game/ Book/ Charts designed.

Why PLAY  
is the way  
children  
LEARN?



Why PLAY  
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Its a CREATIVE  
learning process.

Through Play Children:

- Socialize
- Interact
- Perform
- Learn

It Develops:

- Physical skills
- Cognitive concepts
- Language skills
- Social skills

Design Opportunities:

- By Tactile
- By Sound
- By Gesture
- By Sight

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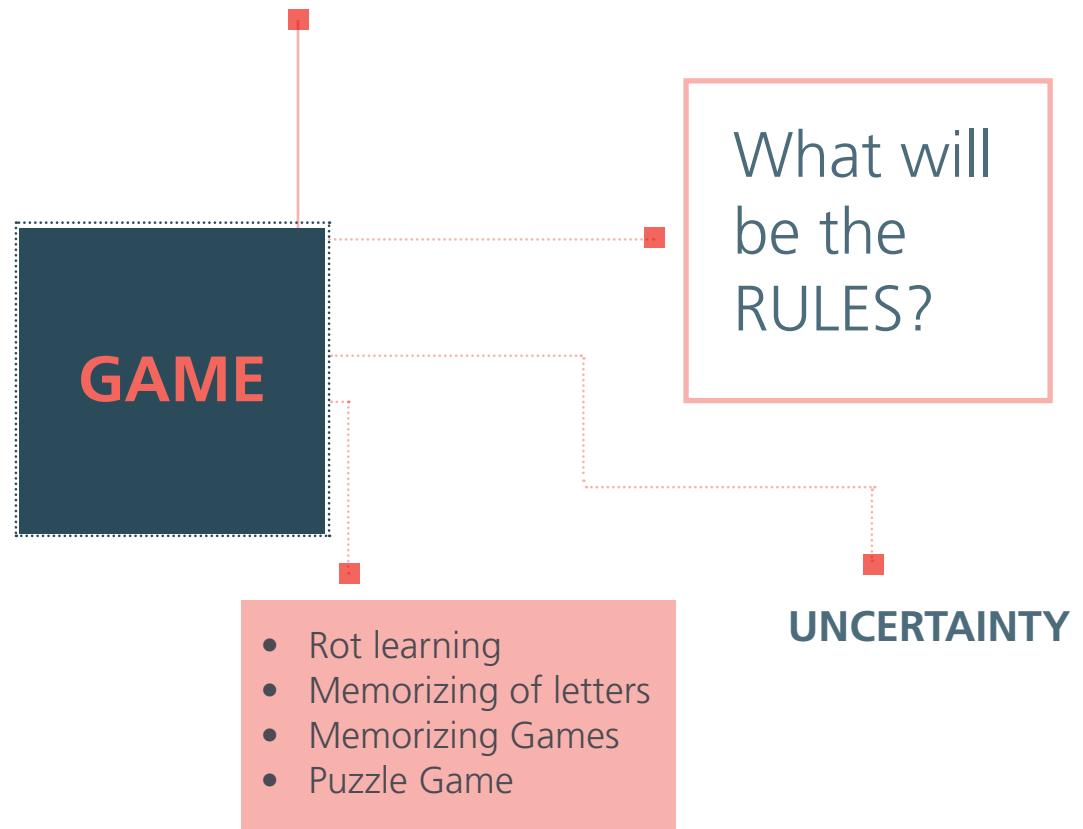
- Socialize
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Different Designing Medium:

- Storybooks
- Board Games
- Toys
- Puzzles



- Card Game
- Board Game
- Interactive Game
- Combination of two  
Board + Card Game





- A for Apple
- A-Aa-E-Ee in *Devanagari*
- Physical activity
- Toy-game
- Outdoor + Indoor

- Card Game
- Board Game
- Interactive Game
- Combination of two  
Board + Card Game

Comparison between  
*Devanagari* script and  
*Gujarati* script

What will  
be the  
RULES?

TASKS to be  
achieved after  
playing the GAME:

- SHAPE
- SEQUENCE
- VISUAL SHAPE OF  
THE ALPHABET
- IDENTIFICATION &  
RECOGNITION OF  
THE NEW SCRIPT

GAME

- Word formation
- Find different letters  
then collect for yourself  
and later construct a  
word out of it

- Rot learning
- Memorizing of letters
- Memorizing Games
- Puzzle Game

UNCERTAINTY

# Initial Concepts

## **Existing Learning Methods:**

A child sees various things around her/his environment. In the school, those things are pronounced. By showing the letter-form associated with those things and by pronouncing it repeatedly they are learnt.

In this way, letters are taught in association with sound & visuals.

By seeing & memorising it again & again a script is learnt.



SCRIPT  
LEARNING

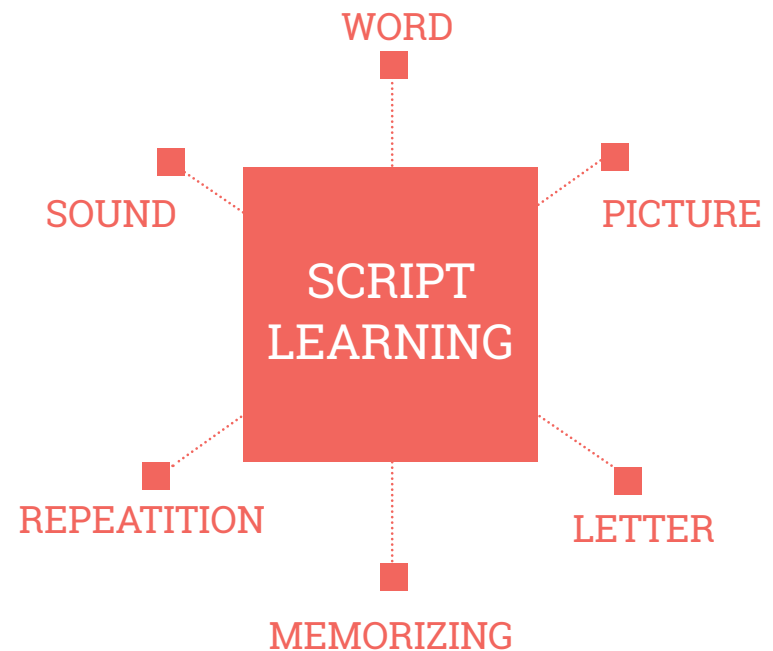
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## Learning Charts:

Two same letter-forms but in different scripts are side-by-side in a flash card. But here there is a letter instead of a picture. This can be used for the introduction of a letter-form, the initial teaching activity for children.

## Board Games:

Board games involves pieces, boards, dice, which move in a specified rules. Rules are a major part in any game. Games can be based on pure strategy, chance, or a mixture of the two, and usually have a goal that a player aims to achieve. It increases socializing of the players and by interaction players can learn the most.



## MEMORY GAMES



### Scene memory:

Position of the object is shown, then changed we have to remember it & correct it.

<http://www.primarygames.com/puzzles/memory/scenememory/>

**Path memory:** A path will be drawn, then we have to remember the path and join according to our memory.

<http://www.primarygames.com/puzzles/memory/pathmemory/>

### Pattern memory:

A pattern is shown, we have to remember it and create the same pattern again.

<http://www.primarygames.com/puzzles/memory/patternmemory/>

### Sequence memory:

Sequence is shown of different shapes we have remember and arrange it sequentially.

<http://www.primarygames.com/puzzles/memory/sequencememory/>

## MEMORY GAMES

### Applications:

- "Memory"- Memory game
- Match-up : Exercise your Memory
- Mahjong Solitaire
- Kids memory game: animals
- Coach memory! Brain trainer
- Princess memory game for kids

<https://play.google.com/store/apps?hl=en>

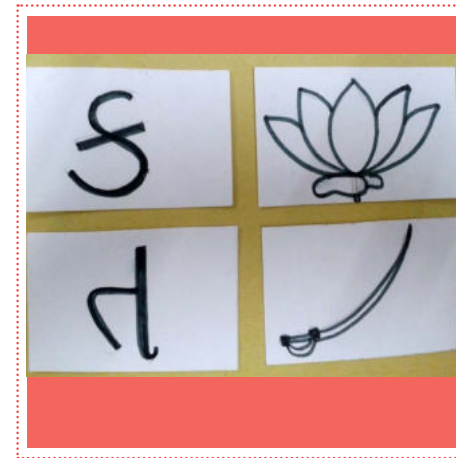
# Concept 1

## Card Game:

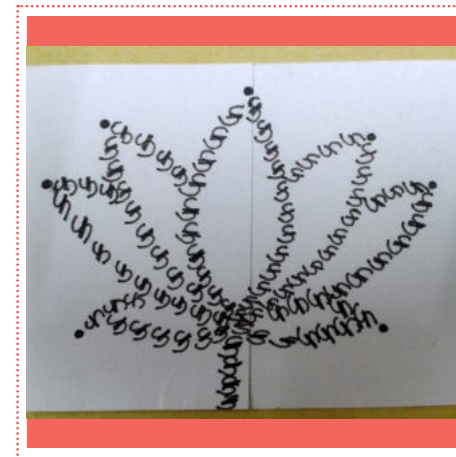
Letter 'Ka' will have clue as Lotus in pictorial form formed by *Gujarati* 'Ka' in `clue cards.

*Devanagari* 'Ka' will not be shown to the child. Player will only see *Gujarati* letter on that picture.

By the help of clue cards, they have to recognise the picture, say the word, observe them and match the correct pair.



Playing Cards

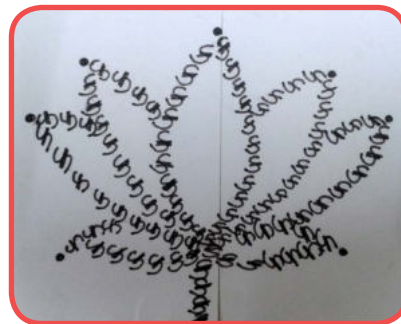
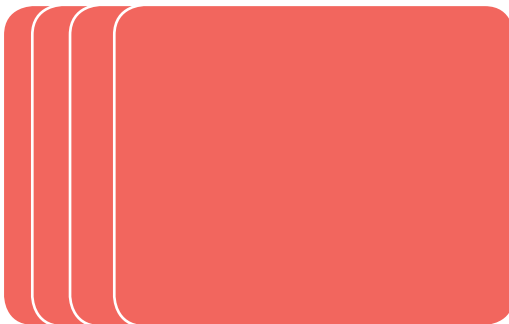


Clue Cards

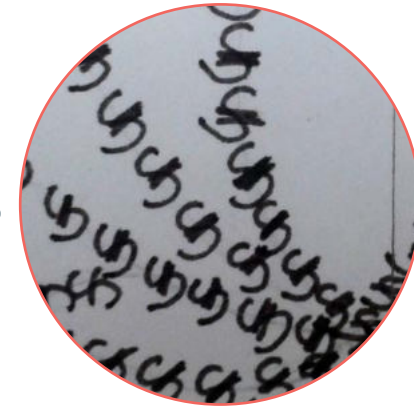
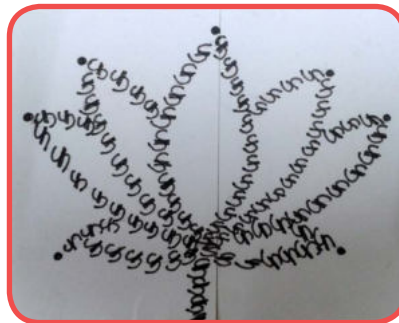
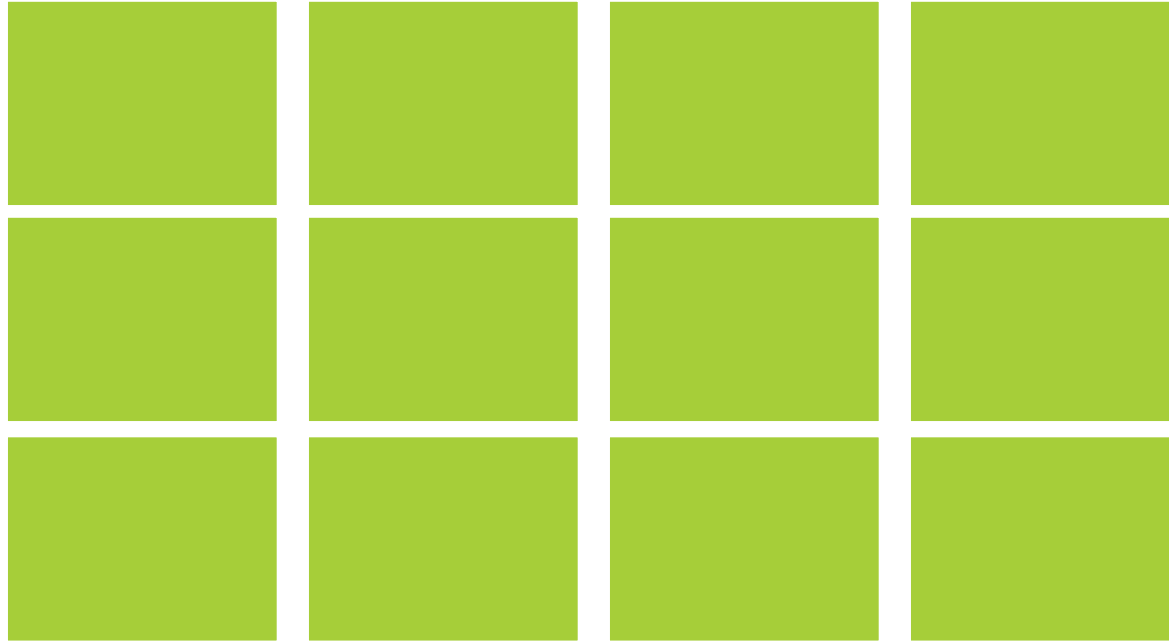
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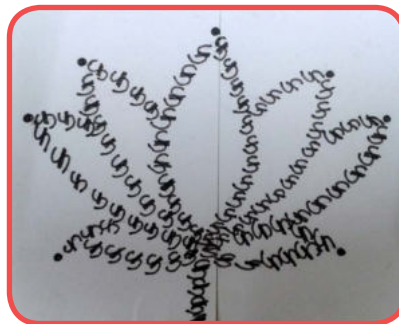
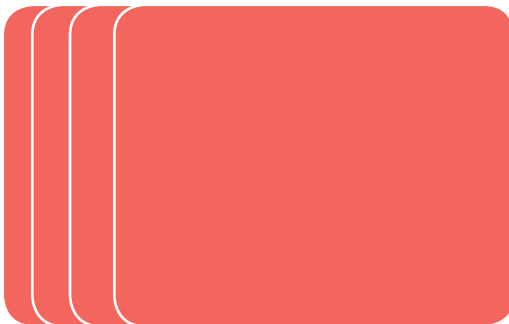
Clue Cards



STEP 1:  
1 Clue Card opens

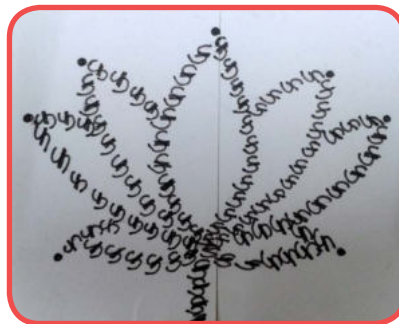
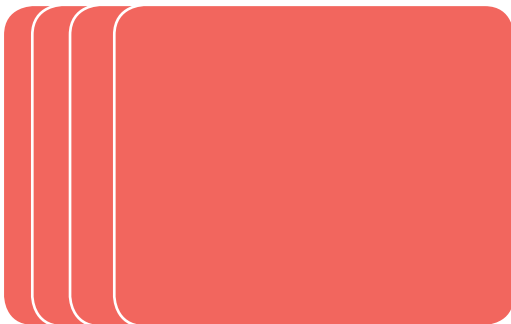


STEP 2:  
1 Playing Card  
opens

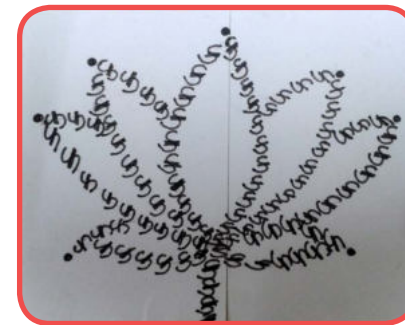




STEP 3:  
Another Playing  
Card opens







STEP 4:  
When they matches, they  
will come out of the game

# Concept 2

- **Game-play:**

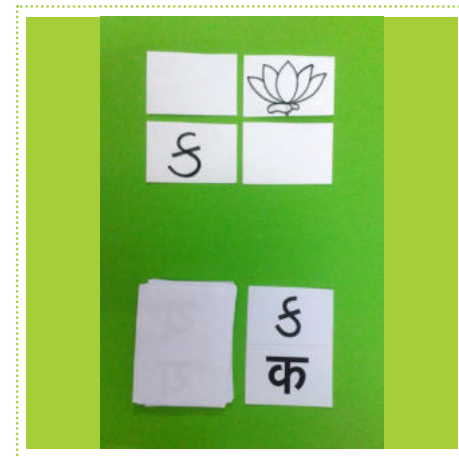
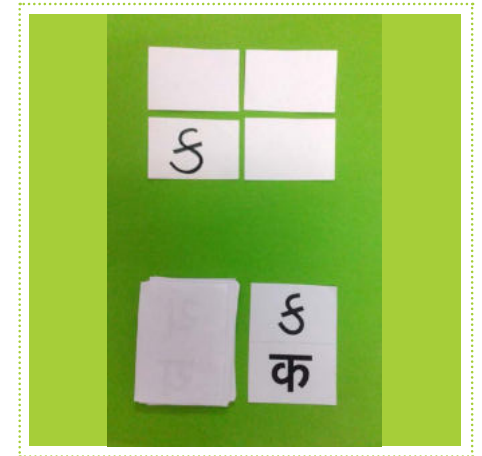
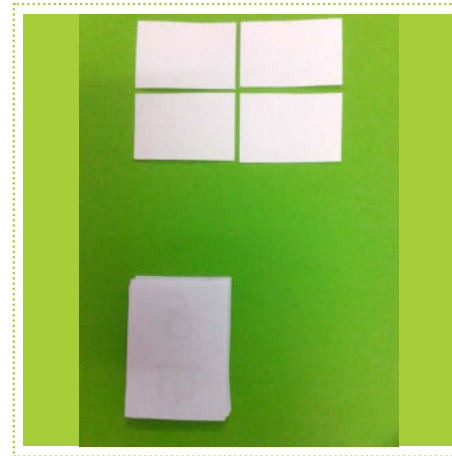
A clue card will open first which has *Gujarati 'Ka' & Devanagari 'Ka'*.

Then a playing card will open which has pictures and *Gujarati* letter-forms.

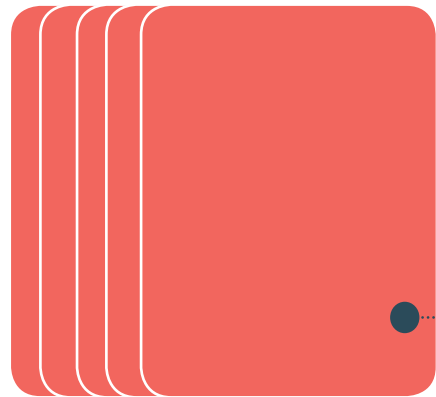
By pronouncing the word, the first letter of the word should be recognised and then matched.

- **Challenges:**

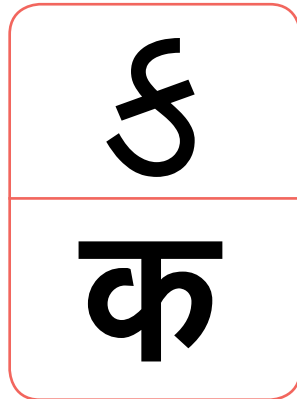
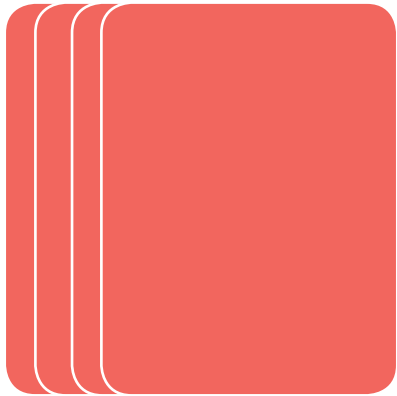
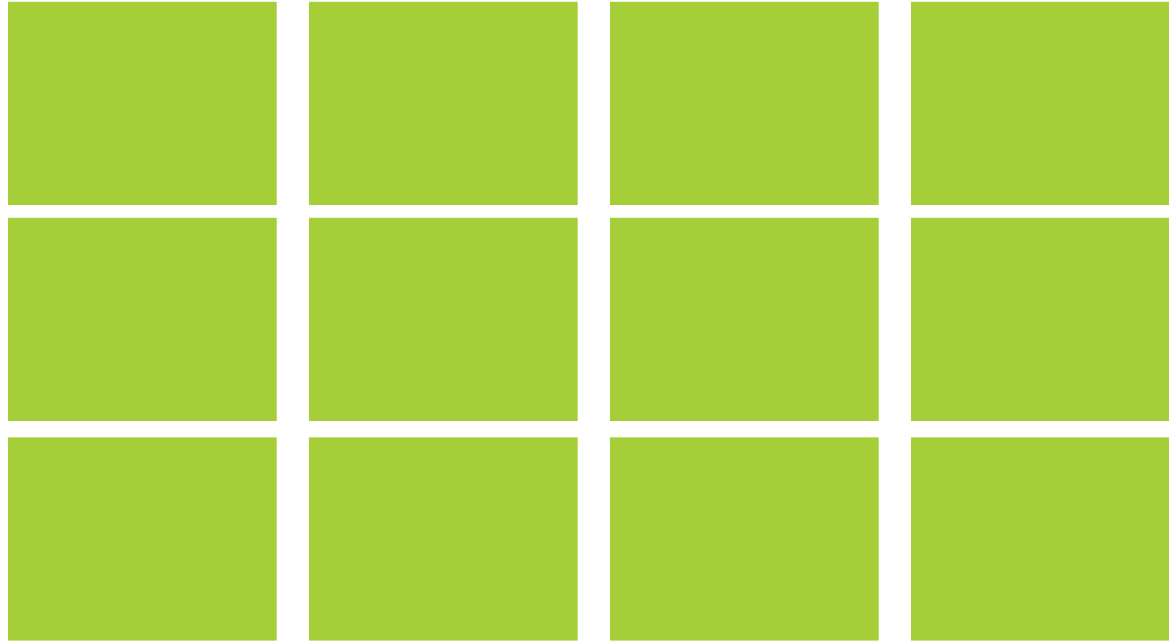
Make the new script recognisable without referring any picture. A new game-play by which better *Devanagari* and *Gujarati* script can better be associated.



Playing Cards

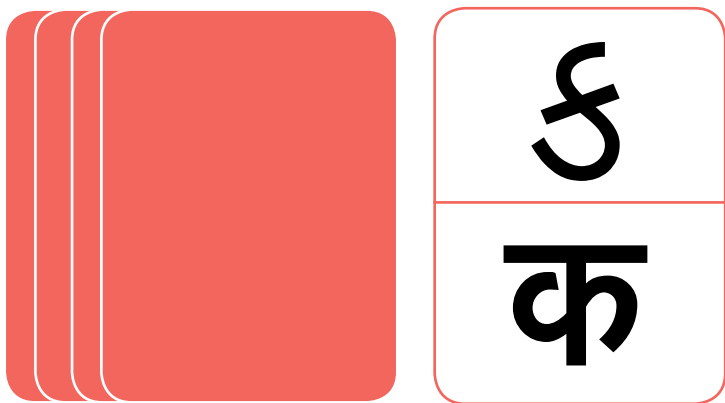
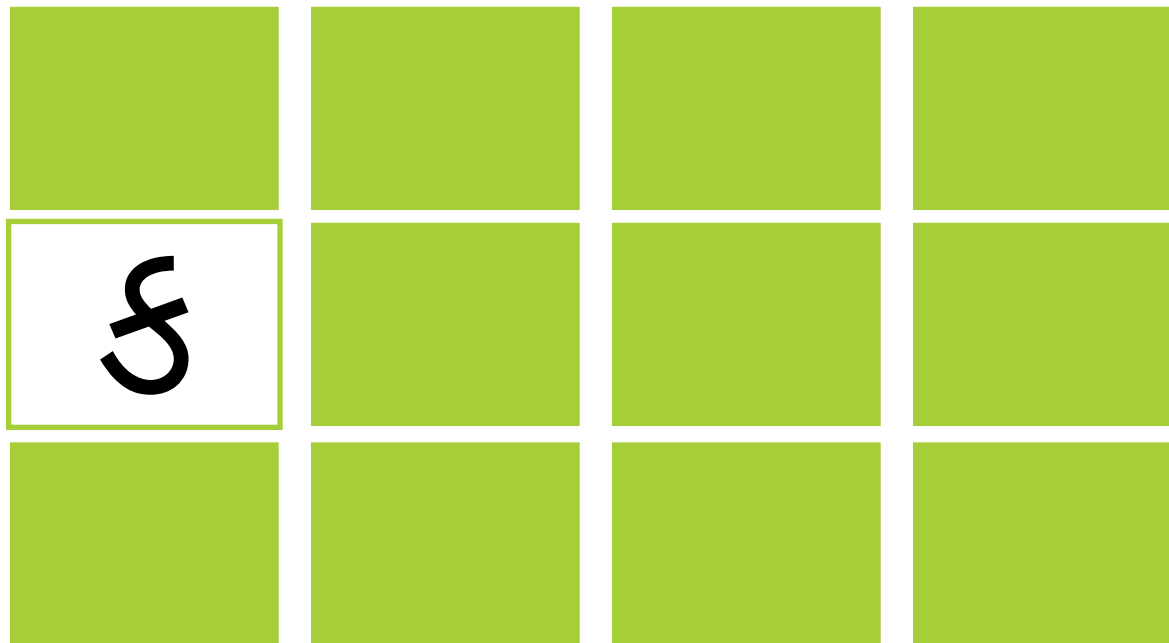


Clue Cards



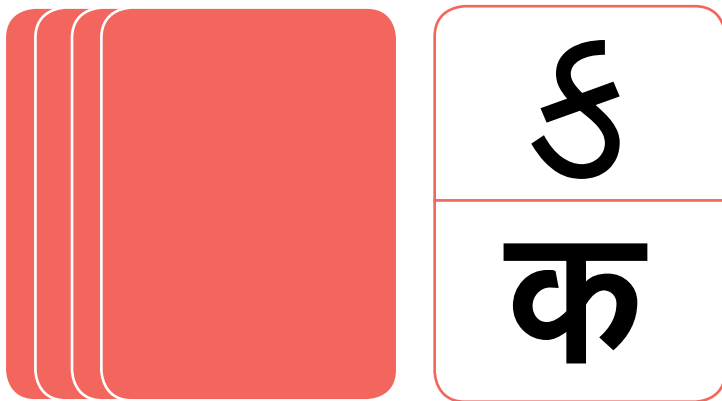
STEP 1:  
1 Clue Card opens

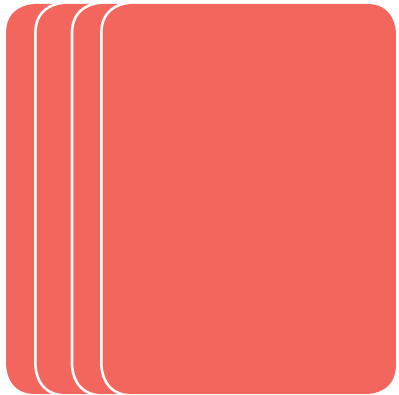
STEP 2:  
1 Playing Card  
opens



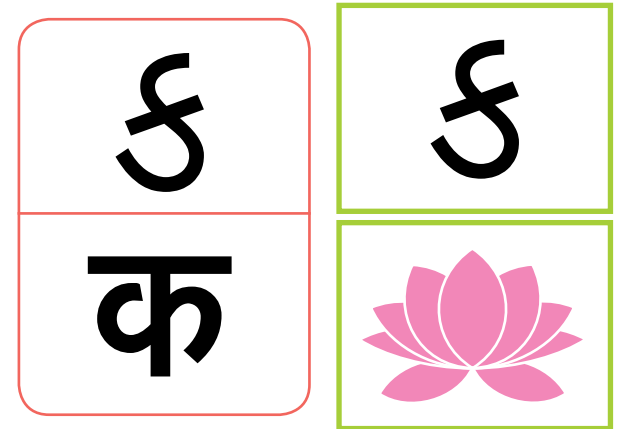


STEP 3:  
Another Playing  
Card opens





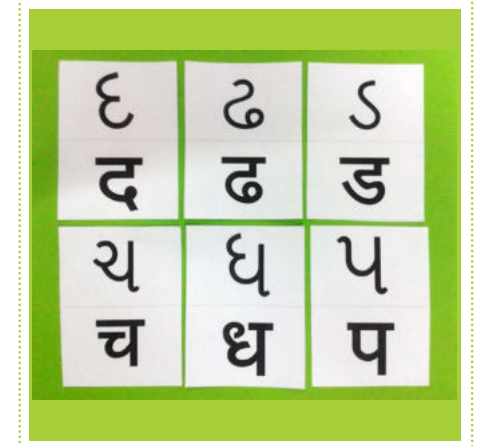
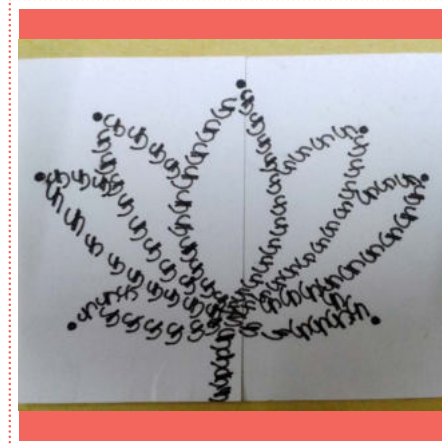
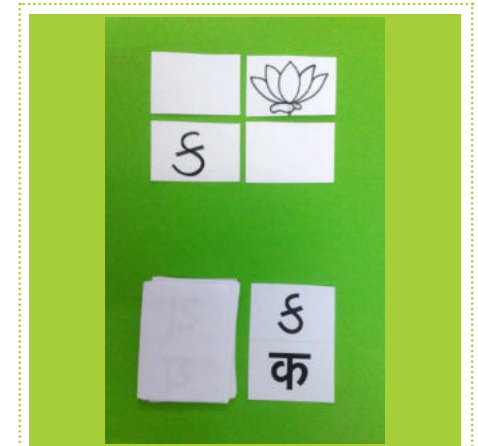
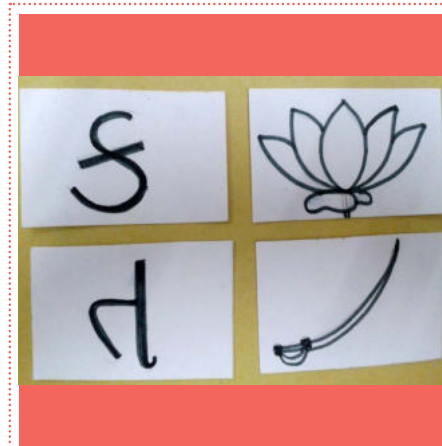
STEP 4:  
When they matches, they  
will come out of the game





# Conclusions (Concept 1-2)

- Knowing the name of the picture is important here.
- If the name of the picture is not known to the player, then they will get stuck at that point and game-play will not happen.
- Letter-form is not seen properly. Pictures familiar to children has to be selected.
- In concept 2, if the picture name is not know, it fails the game-play.
- Pronunciation of the picture should be known in both the languages. Pronouncing of the picture may differ in different scripts.



# Concept 3

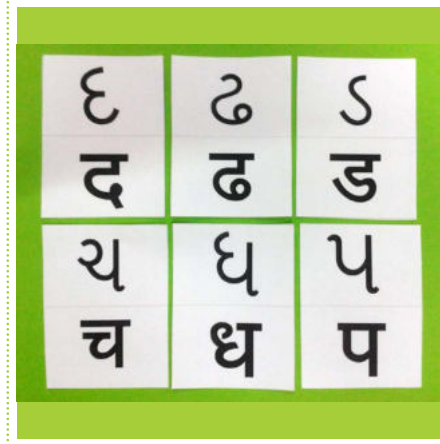
- **Block and Card Game:**

A *Gujarati* letter is written on a block. The block is divided into two.

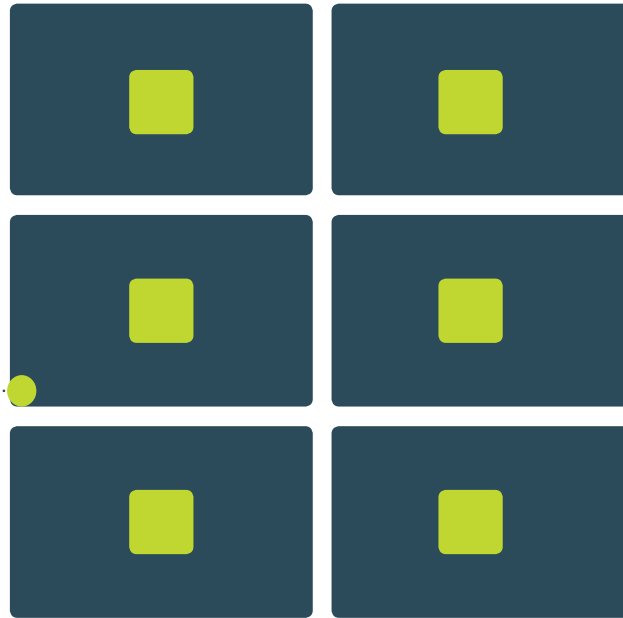
Blocks will be scattered, players have to look in the clue cards and look for correct match and for the new letter.

Each player will build their own tower of correct *Gujarati* alphabets formed.

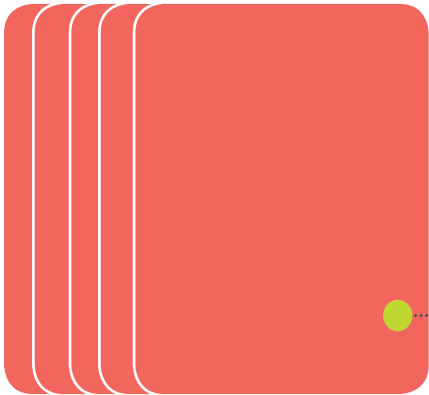
After collecting the letters to test the correct letter-form, the next task will be to form a word (without conjuncts).

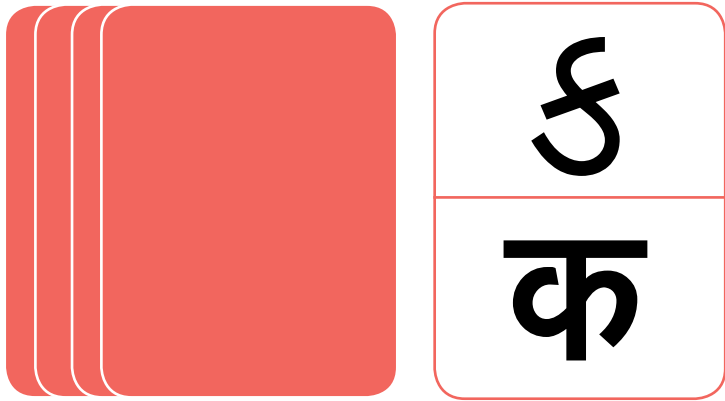


Blocks



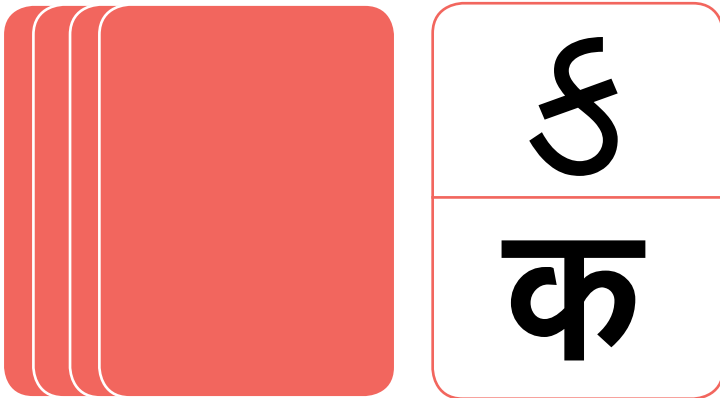
Clue Cards



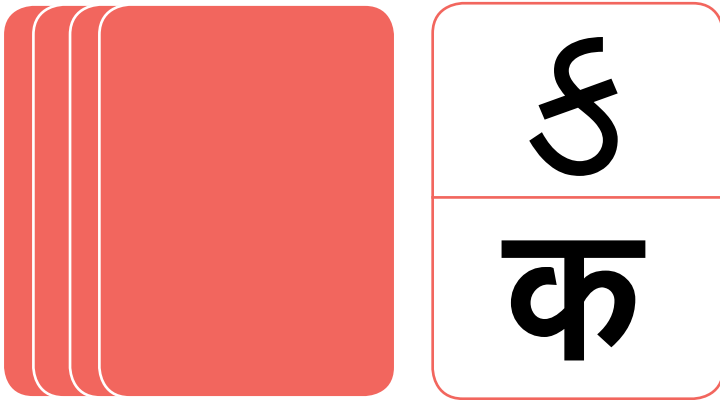
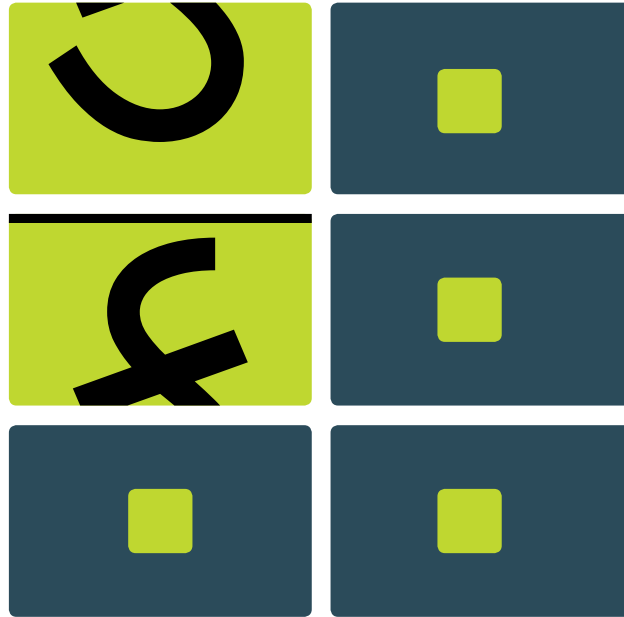


STEP 1

STEP 2

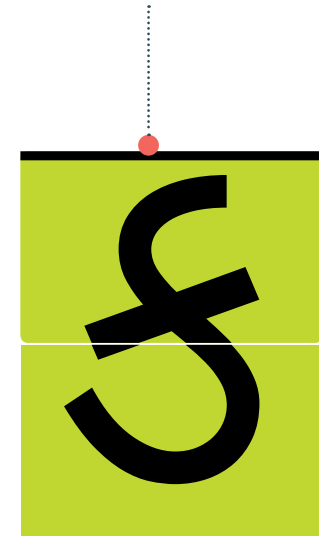


STEP 3

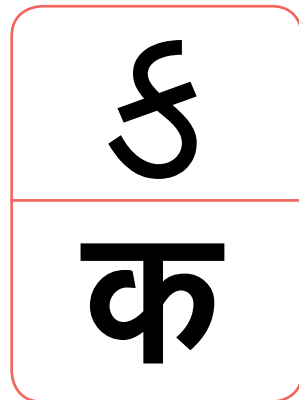
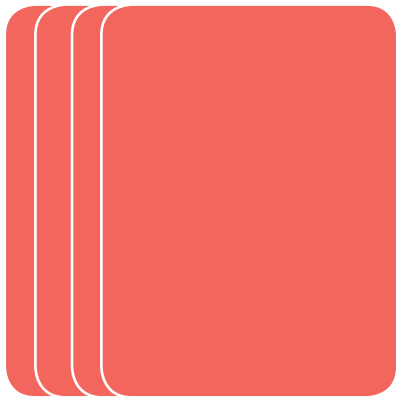




Line clue to indicate upside of the letter



STEP 4





×

व

र

✓

त

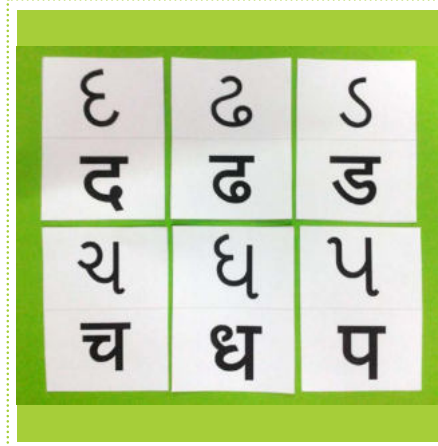
य

त

य

# Conclusions

- Letters were made broken to understand orientation of the letter instead, it created confusion.
- This can misguide the player as different combinations of letter may form a new letter which appears to be correct but are incorrect.
- The task was to collect blocks, and form a word. But if the language is not known, construction of a word is not possible.



# Concept 4

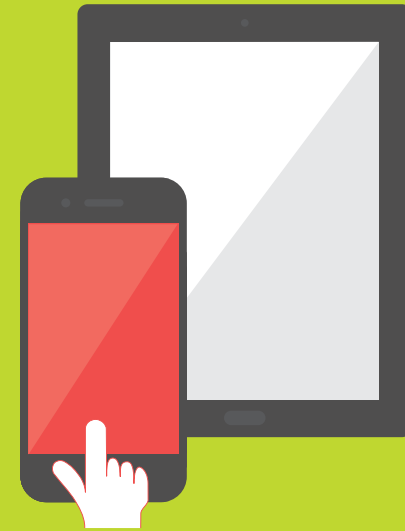
## Touch based application:

### Sound:

When a letter-form is visible, and it is supported by sound, a child could associate them both in a better way.

### Judging:

To tell the player whether the answer is right or wrong is the judgment to be done in this game. As the script is new to players, so in the game if the answer is right or wrong is very important part. In interactive system, the system will be playing the role of judge.



Things are done automatically here.  
Score board, different levels,  
right-wrong indication, time duration  
all these are handled by the script.

### **Number of tile:**

For this game, the number of tiles  
will be too large to handle.  
51 letters and 10 numbers into 2.  
So total is 122 letters. This can be  
solved by levels. Gradually letters will  
be taught in levels. The difficulty level  
will increase accordingly.

### Gujarati Script:

**15** Vowels

**36** Consonants

**10** Numbers

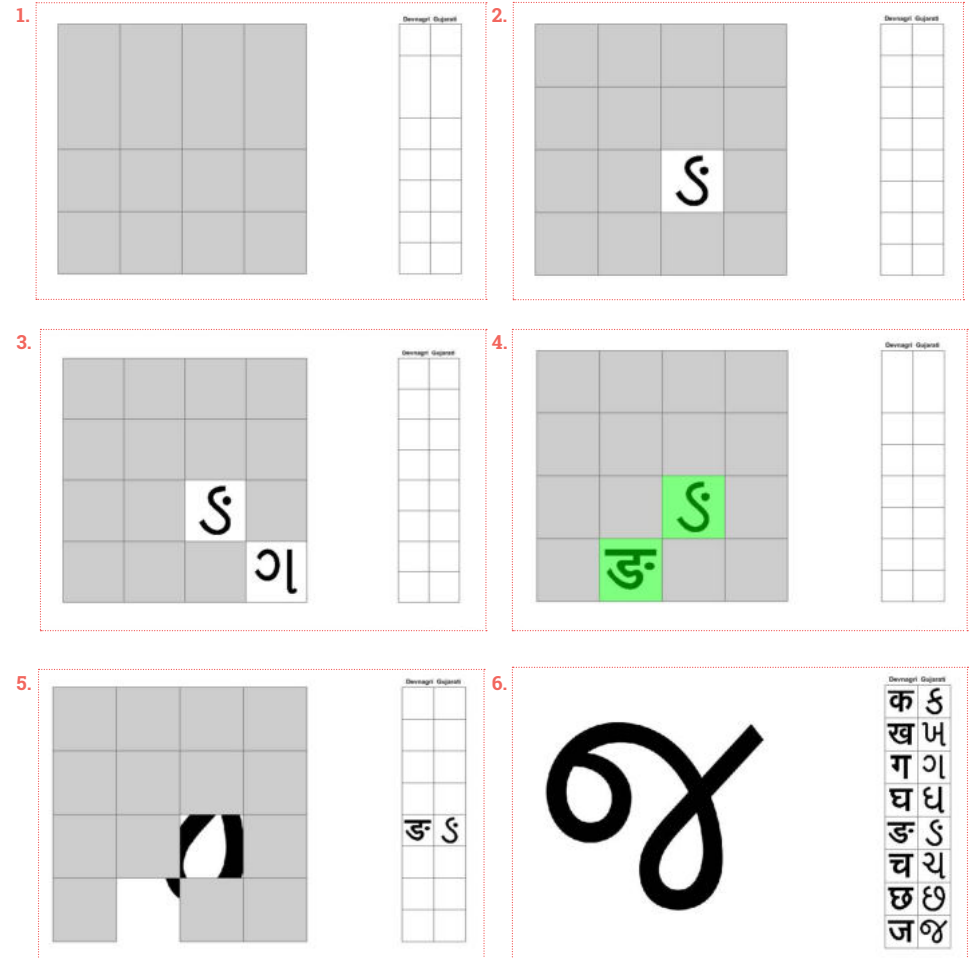
# PROTOTYPE - FLASH FILE

# Results

After testing, children took maximum support of sound to match the letters. By this, attention to visual shape of the letter-form was not given much. When asked them later to recognise these new letters, children could recognise few. Then when, the last question was asked, they could answer it. Letter was then known to the player, they could recall it better. Concentration at the visual shape of the letter is given. Sound support helped children to learn.

## Challenges:

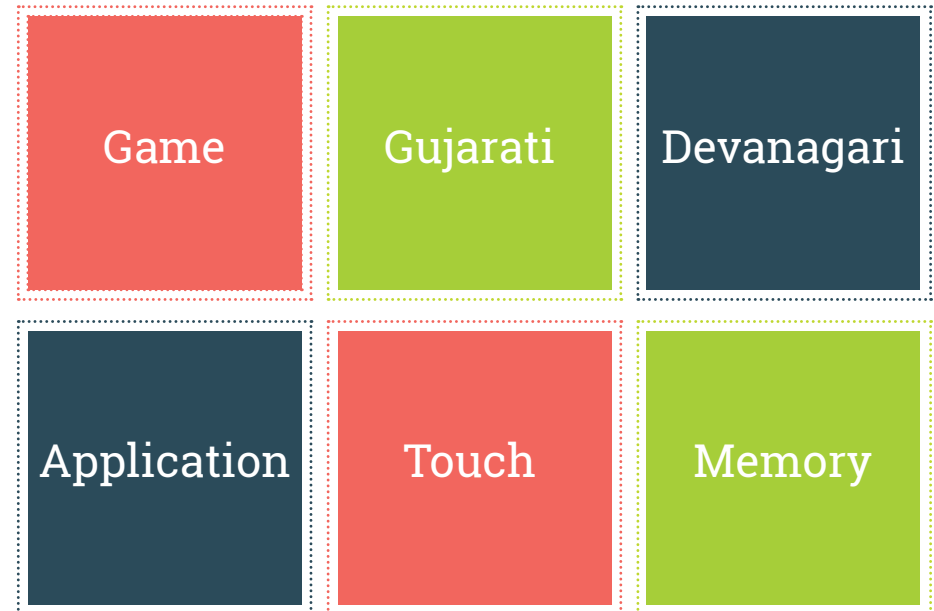
What are the other recall methods for more concentration to the visual shape of the letters? How many letters should be taught at a time?



# Final Concept

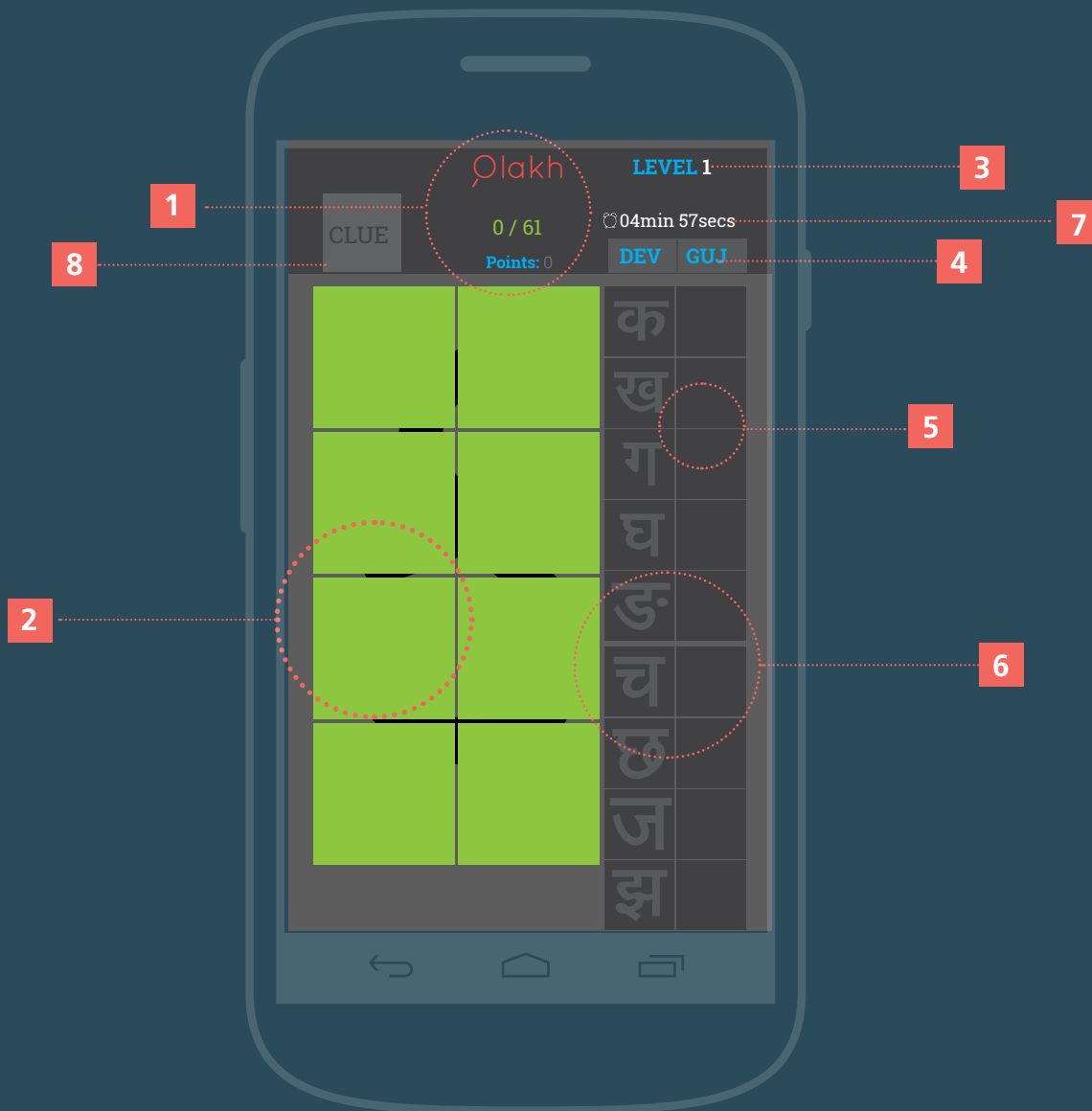
Interactive Memory Game to identify *Gujarati* script by taking *Devanagari* script as a supporting script. As we have seen earlier, repetition of letter-form and memorising it again and again is done. So therefore, taking base of **memory game**, a child would be learning *Gujarati* script in a playful manner.

A **game application** is the medium for the execution of this game. This game will be an android based application. Application can easily be downloaded and the game can be played anywhere on any android device.





# Wire-frame:



## 1. Name, Points, Solved letters:

Title of the game 'Olakh', number of tiles solved out of 61, score board (points).

## 2. Main tile panel bar:

The main game-play will happen here. These tiles are click-able.

## 3. Level:

Level number states here out of 3 levels.

## 4. Script title:

To know the script name for letter bar.

## 5. Letter bar:

To associate two scripts and for reminder.

## 6. Devanagari letters in grey:

They are in sequence for the reference of players to check on how many letters are played and in what sequence?

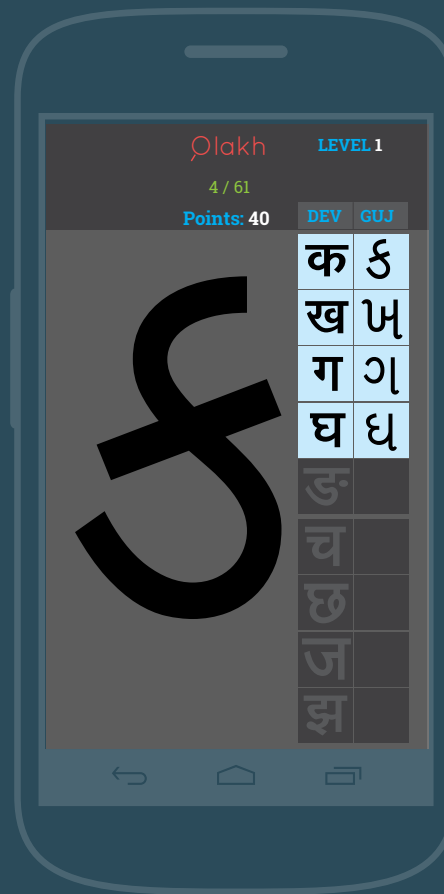
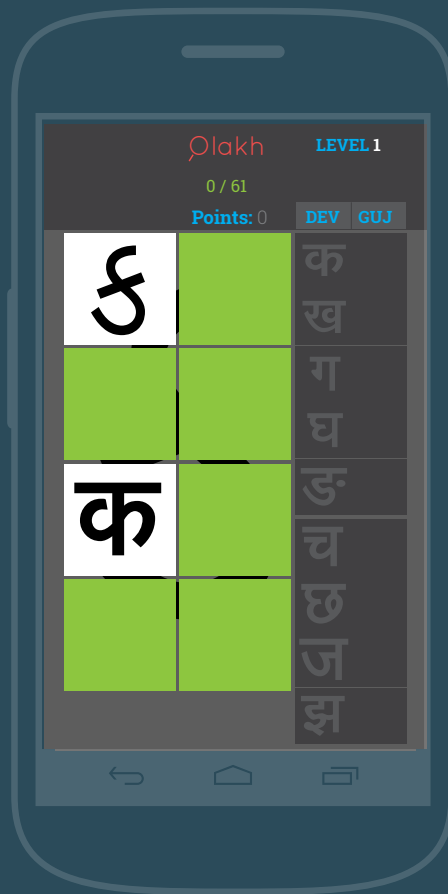
## 7. Timer:

Time will start reducing as the game begins.

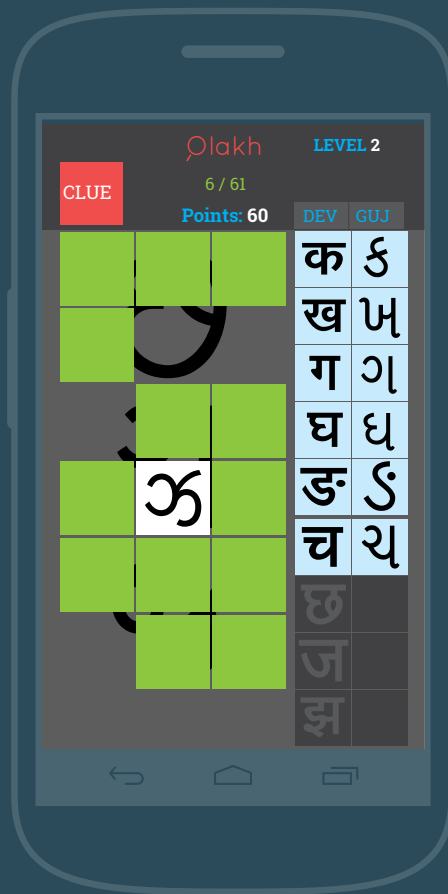
## 8. Clue button:

It will be only active in level 2 and level 3.

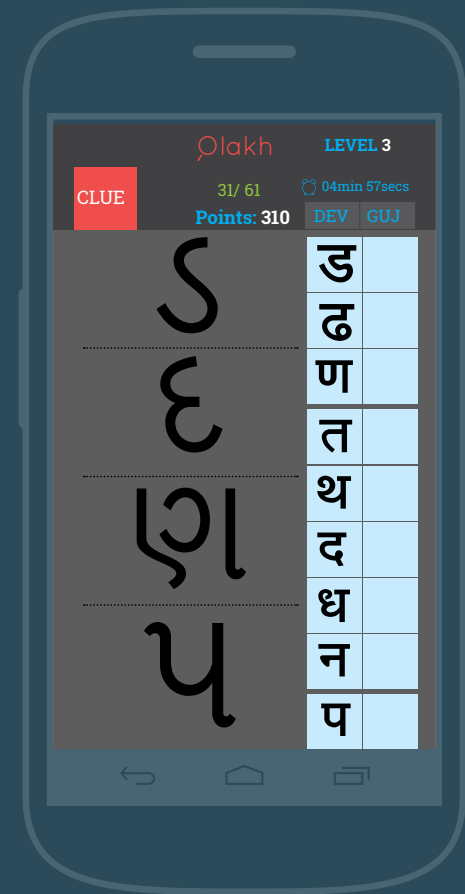
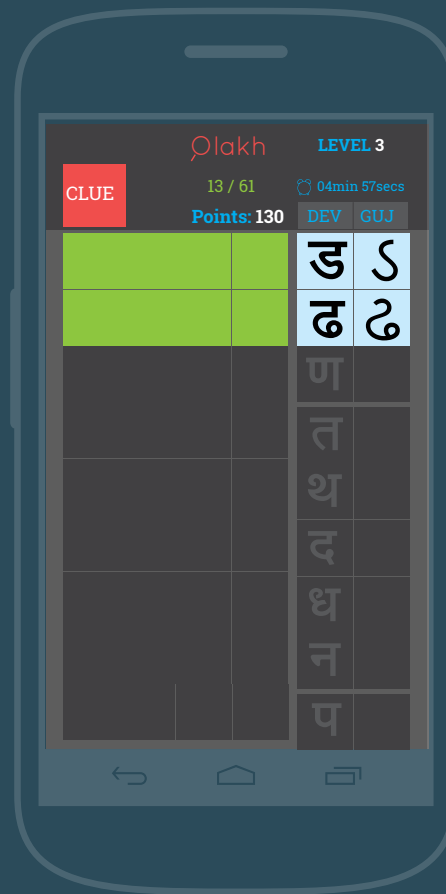
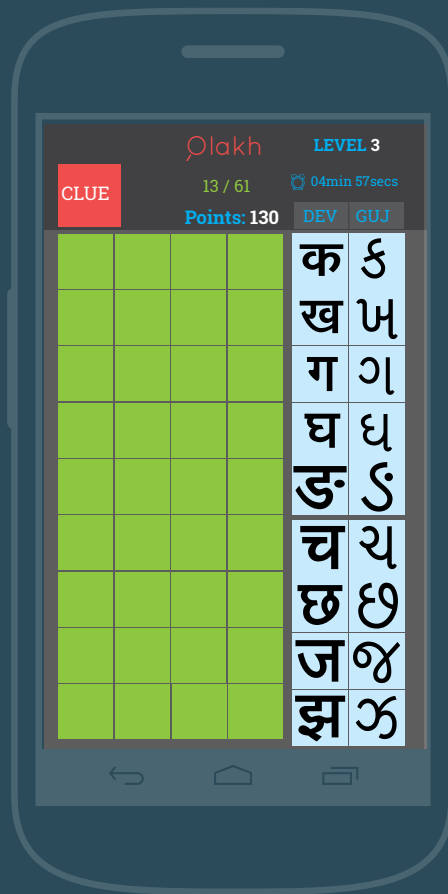
# Level 1




# Level 2



# Level 3

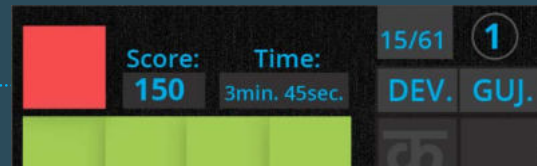
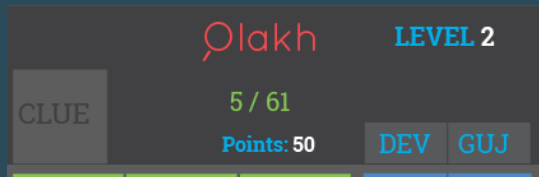


# VISUAL DESIGN

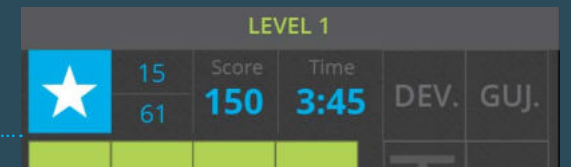
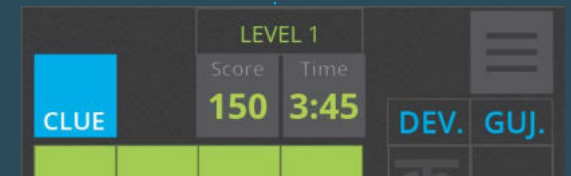
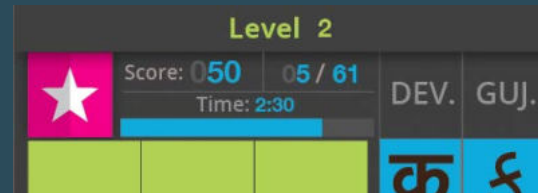


VISUAL  
DESIGN

FEATURES



- Size of the clue button = smallest tile size
- Score Card in numerals
- Time Duration bar to see added time
- Number of Letters solved count
- Level Number
- *Devnagari & Gujarati* script indication



Olakh LEVEL 2

CLUE

5 / 61

Points: 50

DEV GUJ

Score: 150 Time: 3min. 45sec.

15/61 1

DEV. GUJ.

150 3:45 1 15/61

DEV. GUJ.

Level 2

★ Score: 050 05 / 61

Time: 2:30

DEV. GUJ.

क ₹

LEVEL 1

CLUE

Score 150 Time 3:45

DEV. GUJ.

LEVEL 1

★ 15 61

Score 150 Time 3:45

DEV. GUJ.

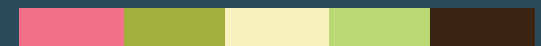
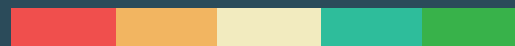


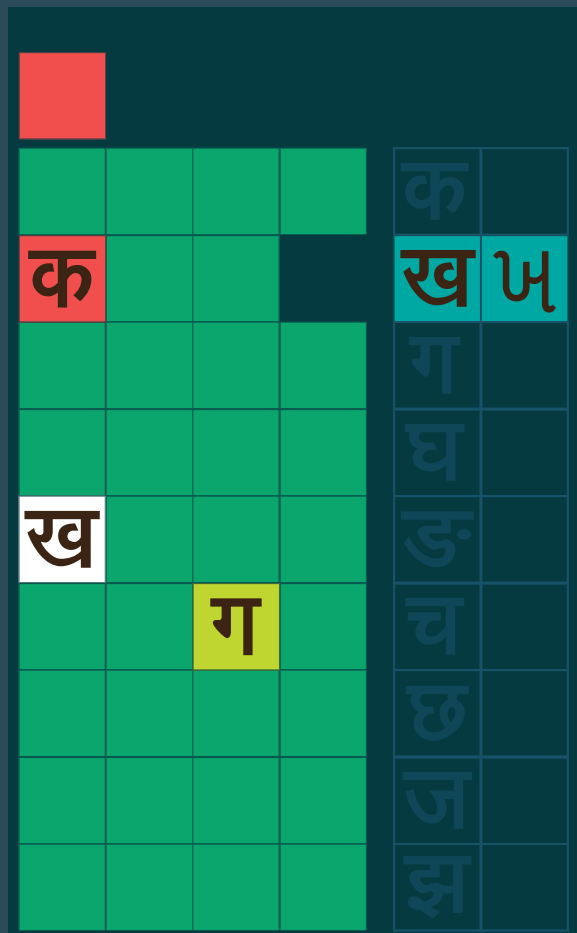
# VISUAL DESIGN



FEATURES  
COLOUR PALETTE

- Playful, as this game is for children
- Bright, with hierarchy of content,
- Suitable for screen.









Level 1

☆

Score: 03003 / 61

Time: 0:50

DEV.

GUJ.

ધ

કઠ

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ગગ

ઘ?

ઙ?

ચ?

છ?

જ?

झ?

Level 2

★

Score: 05005 / 61

Time: 2:40

DEV.

GUJ.

કઠ

ખખ

ગગ

ઘધ

ઙઙ

ચ?

છ?

જ?

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R13 G177 B75

R59 G36 B20

R64 G64 B64

R178 G210 B53

R39 G170 B225

R88 G89 B91

R255 G242 B0

R236 G0 B140

R145 G148 B150

R245 G242 B201

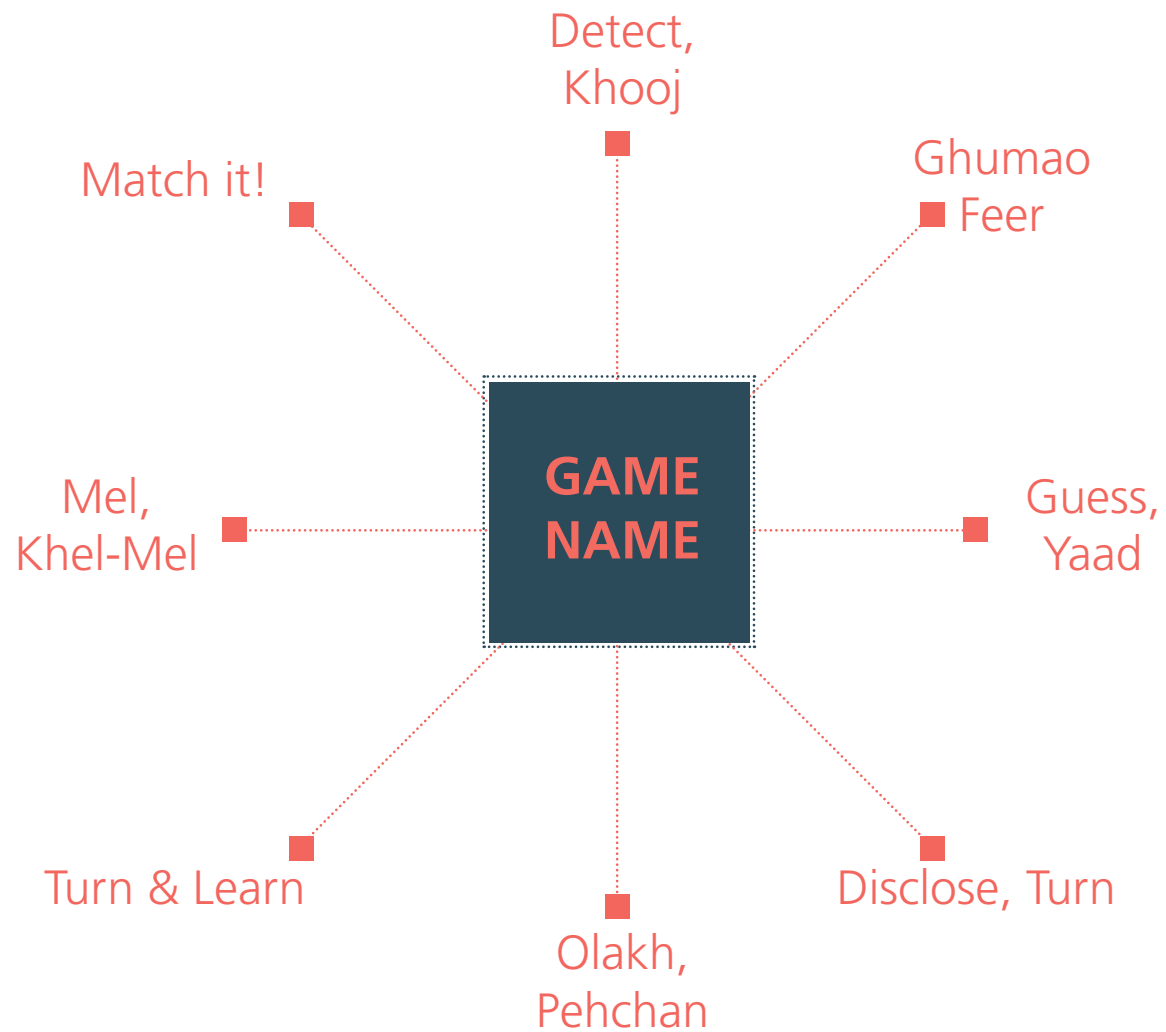
R240 G78 B76

R255 G255 B255

VISUAL  
DESIGN



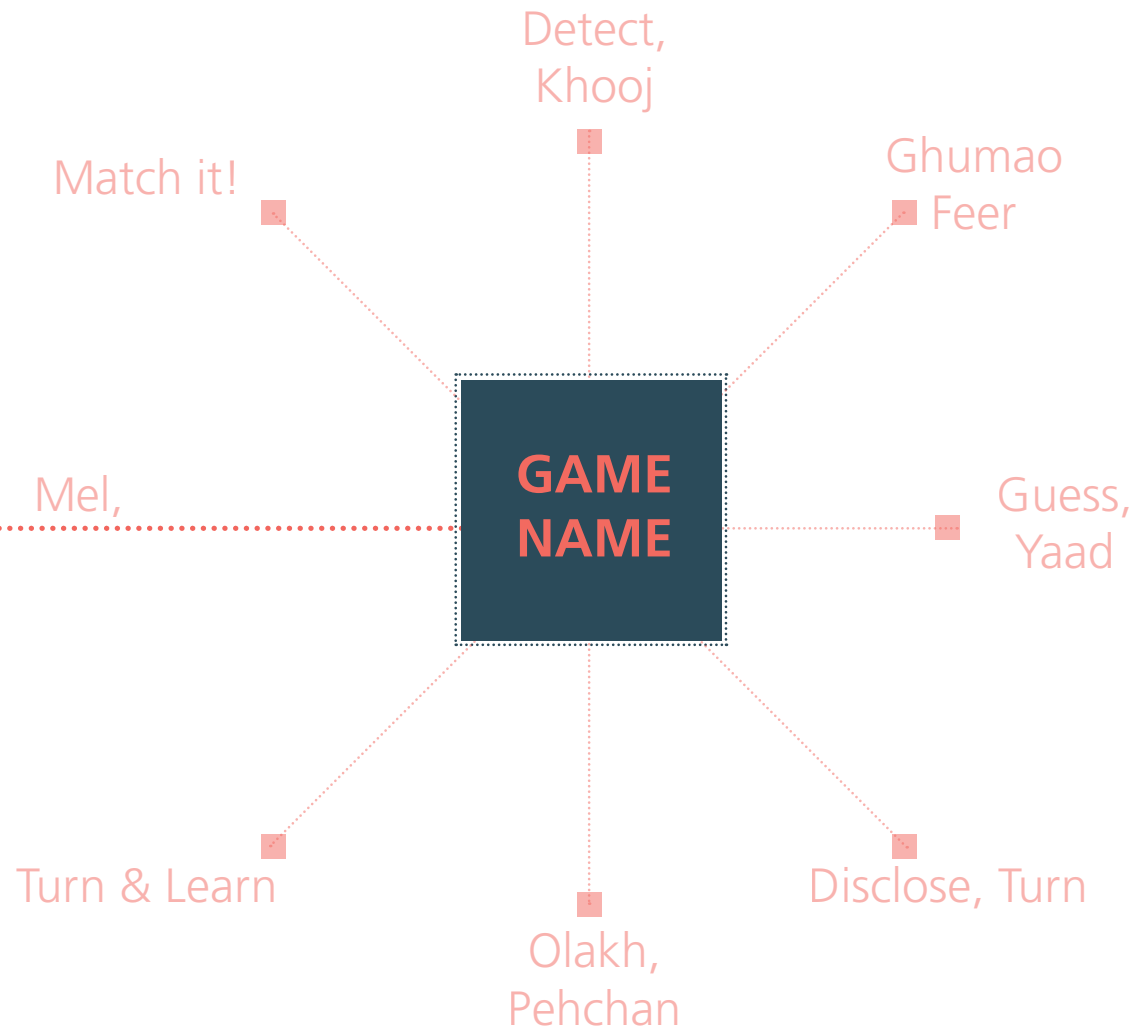
FEATURES  
COLOUR PALETTE  
NAME





# Khel-Mel

'Khel Mel' means play & match in *Hindi* language. As this game is about matching & learning, this name was more suitable.



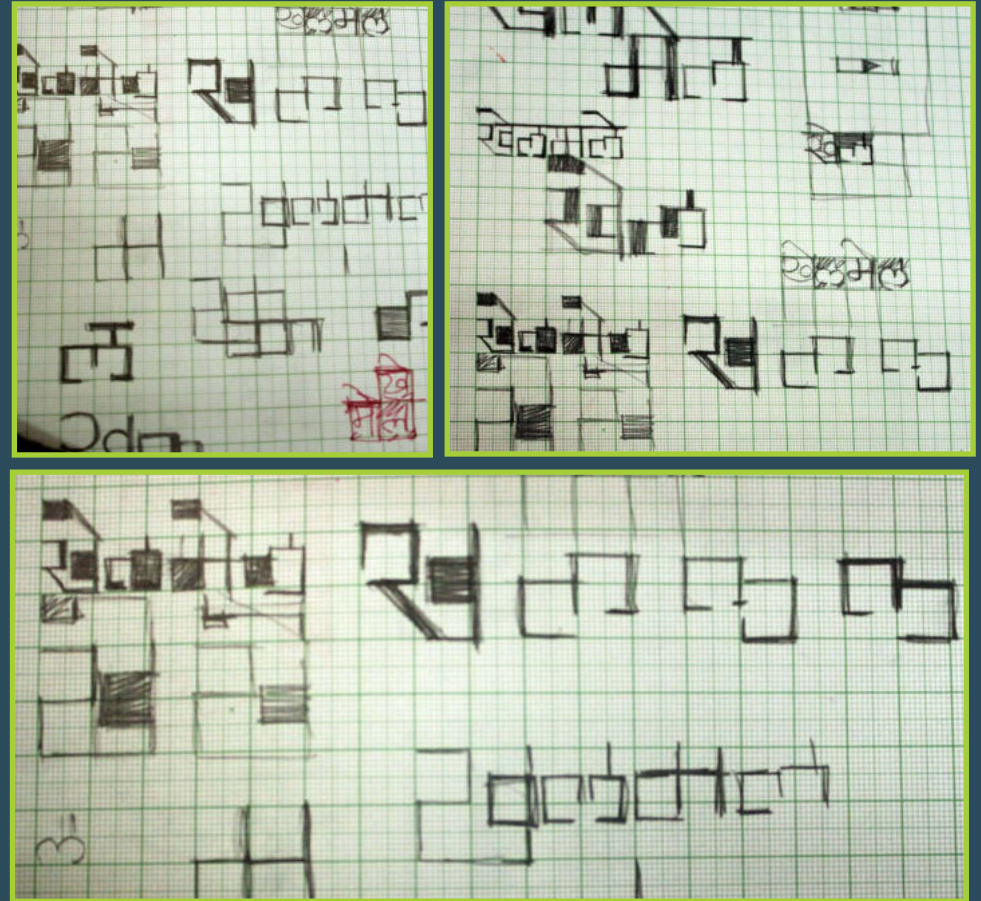
VISUAL  
DESIGN



FEATURES  
COLOUR PALETTE  
NAME  
LOGO

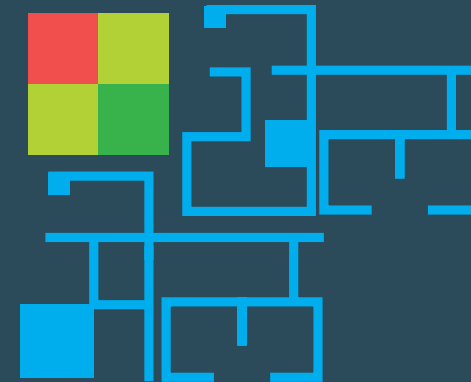
# Idea

- Something related to tiles or square was required to match the language of the whole game.
- As the words are in *Hindi* language, the logotype in *Devanagari* was made to make it look more interesting and unique.
- Hence, this logo was made in a box grid to follow the tile language.

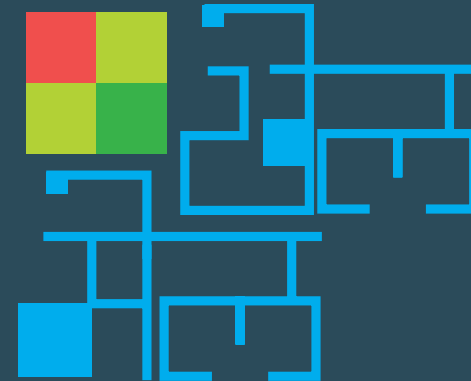


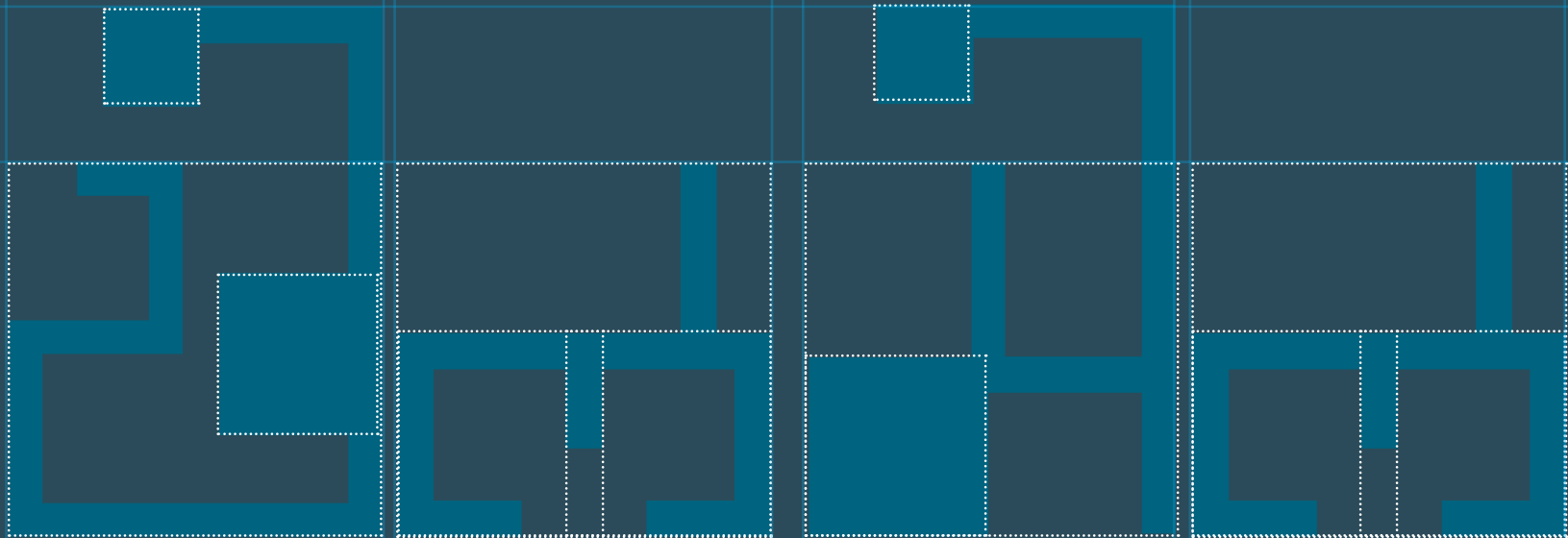
खे मे

खे मे



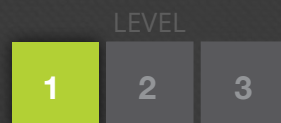
खे मे





Same colour and form to letter-  
form 'LA' to represent match i.e.  
'Mel'





© IDC IITB



Congratulations !!!  
You have learnt  
4 Gujarati letters :)

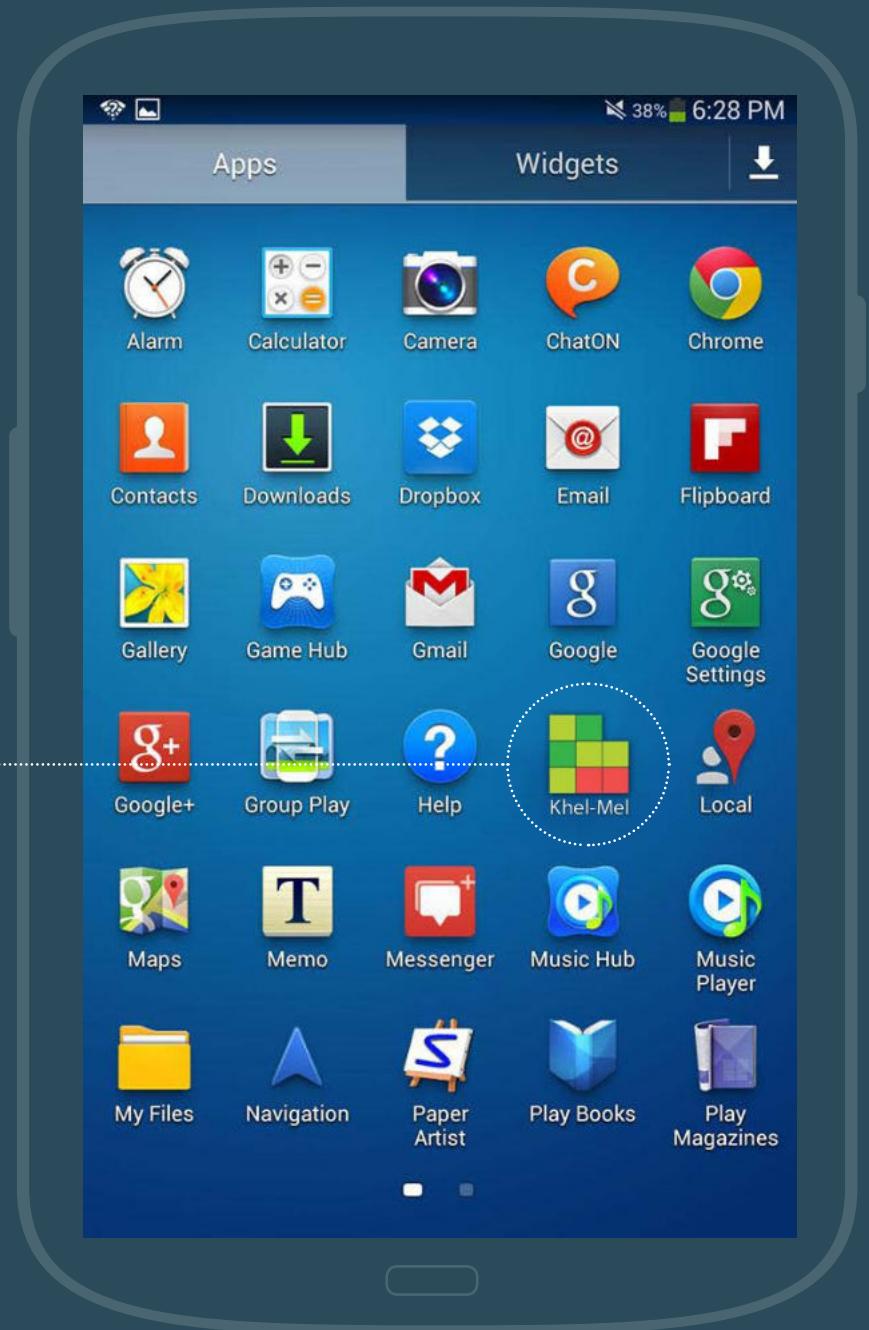
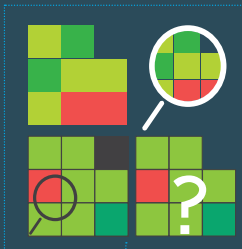
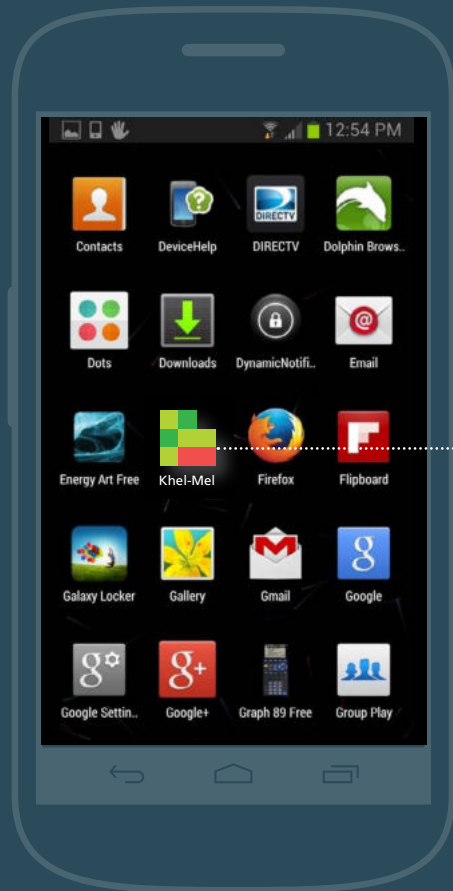
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# VISUAL DESIGN



FEATURES  
COLOUR PALETTE  
NAME  
LOGO  
ICON



# Game-play



<http://www.digitaltrends.com/wp-content/uploads/2013/03/EVST2263.jpg>

# Results

- **Clue button functions:**

Initially when clue is taken, player could see the correct answer in the box but then too he/she has to find the correct answer in the tiles. This didn't help the game play. So, the change was made in such a way that the answer is solved, and goes into letter panel.

- **Time duration:**

Total time given was 5mins. in total. But while testing we found out, time was either less or more in some cases. So to benefit the game-play, when the clue is taken, a grace time will be added to the total time. So that the player gets more interested in the game-play. Game starts with 3mins.



Time: 2:58



# Learnings

- Recognition of *Gujarati* script
- Application design
- Application design for a Game
- User interface design of the Game
- Interaction of the application for the best results of the game-play
- A child's perception and thinking while playing a game
- Visual design by which game can be better understood

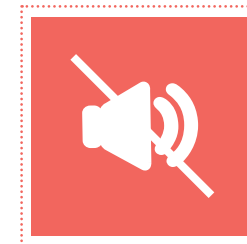


# Future Plans

This game can be used to recognise **any two Indian language script**. By taking support of sound, if the game played in this manner, it would easier to learn any Indian script.

Not only children but **adults** too can play this game to learn *Gujarati* script. For a **typographer, who wants to design a Gujarati font**, this game can be a guideline for them to learn the script and then design.

As there is repetition of sound & letter-form included in this game, a **partially hearing impaired person** too can play and learn a new script similarly.



# PROTOTYPE



# References

## Research Papers:

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BY: R. Mahesh K. Sinha, IIT, Kanpur,
- Wisconsin Council on Children and Families Brain Development:  
The Early Year
- Sound & Letter Time: Building Phonemic Awareness And Alphabet Recognition Through Purposeful Play BY: Michal Rosenberg, Ph.D.
- The Importance of Play in Promoting Healthy Child Development and Maintaining Strong Parent-Child Bonds BY: Kenneth R. Ginsburg, MD, MEd, and the Committee on Communications, and the Committee on Psychosocial Aspects of Child and Family Health

## Websites:

- [www.hindustantimes.com/India-news/NewDelhi/IIT-prof-s-pan-Indian-script-for-languages/Article1-1099940.aspx](http://www.hindustantimes.com/India-news/NewDelhi/IIT-prof-s-pan-Indian-script-for-languages/Article1-1099940.aspx)
- <http://en.wikipedia.org/wiki/Devanagari>
- [www.childcareland.com](http://www.childcareland.com)
- [www.prekinders.com](http://www.prekinders.com)
- [www.madratgames.com](http://www.madratgames.com)
- <http://www.primarygames.com/puzzles/memory/>
- <http://www.mathsisfun.com/games/memory/>
- <http://www.brainmetrix.com/memory-game/>
- <http://www.mindgames.com/memory-games.php>
- <http://www.zefrank.com/memory/>
- <http://www.gamesforthebrain.com/>

## **Book:**

- Designing For Children  
By: Catharine Fishel

## **Font family:**

- Gujarati Sangam MN
- Mukund-1
- Frutiger LT Std
- Roboto Slab

## **Softwares:**

- Adobe Illustrator
- Adobe Indesign
- Adobe Photoshop

# Acknowledgements

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Please give your valuable feedback...

