

CODE LANGUAGES (LEVEL 2)

Description	Learners will discover the purpose of language and begin to get more familiar with the evolution of language as well as codes. They will explore invisible ink, glyphs, numerical codes, braille and sign language to finally design their own code letter
Leading Question	Can you write a letter in a hidden code language?
Total Time Required	5 hours over 5 days
Supplies Required	Paper, Pencil, Eraser, Dough, Lemon Juice, Cotton and Matchstick, Fruit, Salt, Water
Learning Outcomes	<ol style="list-style-type: none"> 1. Understanding of the history and evolution of language especially from oral to written language 2. Understanding the different types of language for those with visual or auditory impairments 3. Understanding numerical concepts and patterns through written language
Previous Learning	None

DAY 1

Today you will begin by exploring and understanding the history of languages.

Suggested Duration	Activity and Description
20 minutes	<ul style="list-style-type: none"> • Think of how many languages you can speak, read and write and: <ul style="list-style-type: none"> - Write or say out loud the same word in the different languages that you speak. For example: Water in English, Paani in Hindi and Maa' in Arabic. What are the most common words used in your language? Think of the top 5 words you use and write or say them in the 2 – 3 languages you know?

	<ul style="list-style-type: none"> - Write the same alphabets in multiple scripts, for example: what would the letter A, B, C be in the other language's script? - Do you know our language represents culture – how many words do you have for something common or something only found where you are from? For example: in many parts where there is a lot of rain and flooding there are multiple words for this. - Do you know that language is evolving with us adding words on a regular basis e.g. the word jungle was added into the English vocabulary, as the UK does not have tropical jungles. The word “screen time” was added as this new concept based on the development of internet and computers
20 minutes	<ul style="list-style-type: none"> ● End this activity by designing 5-10 of your own alien or “made up” words. These words can represent an emotion that you do not think there is a word for. E.g. when you are angry because you are sleepy.
10 minutes	<ul style="list-style-type: none"> ● Begin to explore how oral language evolved and the importance of writing. <ul style="list-style-type: none"> - Different languages can be written in different scripts or are often written with the same script. Either these languages have similar roots or backgrounds (e.g. Hindi, Marathi or Gujarati is written in Devnagari or Hindi script since all these languages originate from Sanskrit) Swahili is used in the English or Roman scripts since it used to be an oral language.
15 minutes	<ul style="list-style-type: none"> ● Play Chinese Whispers ● Chinese Whispers: listen to a story from someone in the family (please make sure this is not a common story that people know from before). Re-narrate the story to another family member. The third family member will narrate this story to another family member. Reflect on how this story changes as more and more people hear and retell it.
10 minutes	<ul style="list-style-type: none"> ● Rhyming verse: now convert the same story in verse and give it a beat. Reflect on how much easier it is for you to remember? Often our old stories were told in verse to help you remember it.
5 minutes	<ul style="list-style-type: none"> ● Practice oral memory by using a long number – this can be a random phone number, or someone's full birthday, or 2 phone numbers together. ● You are not allowed to write this number down anywhere and we will test if you remember it tomorrow.

DAY 2

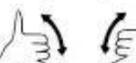
Today you will reflect on how difficult remembering things are and how important it is to remember things accurately.

Suggested Duration	Activity and Description
5 minutes	<ul style="list-style-type: none"> ● Begin the day by recalling the number. ● Reflect on how difficult it is and write a short paragraph on the reason that written language evolved and what things are important to record accurately. Prompts include accounts/numbers, medical procedures, etc.
15 minutes	<ul style="list-style-type: none"> ● Begin exploring some of the older written languages. When people first started the written language, they used something called glyphs – instead of alphabets, which was pictures to represent words. These drawings were often done on stone walls before paper was invented ● For example: a girl, Luna, went out in the sun to fly a kite. It began to rain and her kite got wet and torn so Luna was sad. <div style="text-align: center;"> </div>
15 minutes	<ul style="list-style-type: none"> ● Make glyphs of 10 common words. Think of how they can draw these words so that everyone can understand them. It is important that this drawing also be easy to copy. <ul style="list-style-type: none"> - Two weather elements e.g. Rain and Wind - Two animals e.g. Dog and Parrot - Two places e.g. Home and School - Two people e.g. Mother and Friend - Two objects e.g. A Toy and Car
15 minutes	<ul style="list-style-type: none"> ● Write a short 5 sentence story in glyphs.
30 minutes	<ul style="list-style-type: none"> ● Play a game of Pictionary with your family: <ul style="list-style-type: none"> ● Preparation <ul style="list-style-type: none"> - 20 cards with words to be drawn e.g. Flower, Horse, Computer etc. - 2 or more teams with each team having 2 or more members - Paper, pencils and erasers or a board and chalk to draw - A paper with a points column for each of the teams

- Rules
 - One team member from each team will pick 5 cards
 - The same team member will draw each of the words on the cards
 - The other team member will guess the word based on the picture
 - Each team gets as many points as the words they guess, with the maximum being 5 points per round
- Add the total after playing one or two rounds of the game and compare the larger number to decide who won the game.
- Optional: to have an extension of the game, the cards can have full sentences that have to be drawn and guessed using glyphs.

DAY 3

Today you will explore how language works for those with compromised vision or total blindness and similarly with those that are unable to hear.

Suggested Duration	Activity and Description
5 minutes	<ul style="list-style-type: none"> ● Think of how you can communicate with someone who is deaf and cannot hear. ● Put some cotton in your ear and ask family members to whisper to be able to relate with the deaf. ● Sign language is the visual-manual language of those with hearing issues – people make words and letters using their hands. ● Examples: <div style="display: flex; flex-wrap: wrap; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>eat / food</p>  <p>help</p>  <p>more</p>  </div> <div style="text-align: center;"> <p>bathroom</p>  <p>finished</p>  <p>play</p>  </div> </div>

5 minutes	<ul style="list-style-type: none"> ● For those who do not have visual tools – pretend you are eating food that is often the sign for food and eating. Hold both hands up palms facing out that shows finished, etc.
15 minutes	<ul style="list-style-type: none"> ● Think of signs for 5 of the most common words you use. ● Now try and do a sentence by acting it out/signing it out.
30 minutes	<ul style="list-style-type: none"> ● Play a game of Charades to understand communication by signing and acting it out. ● Preparation <ul style="list-style-type: none"> - 20 cards with words to be acted / signed out e.g. Flower, Bird, Hungry etc. - 2 or more teams with each team having 2 or more members - Paper, pencils and erasers or a board and chalk to draw - A paper with a points column for each of the teams ● Rules <ul style="list-style-type: none"> - One team member from each team will pick 5 cards or think of other words to act out - The same team member will act each of the words on the cards - The other team member will guess the word based on the acting - The team member acting out the words is not allowed to use verbal clues ● Each team gets as many points as the words they guess, with the maximum being 5 points per round. ● Add the total after playing a couple of rounds of the game and compare the larger number to decide who won the game.
5 minutes	<ul style="list-style-type: none"> ● Explore how blind people read since they cannot see words or letters. Think of how you would help blind people read and write or say a few ideas. ● Explore the concept of Braille, which is a written language the blind can read through touching the letters.
10 minutes	<ul style="list-style-type: none"> ● Use flour dough or playdough to make letters and words. Ask family members to close their eyes and feel these. ● Also, you can write letters on thick paper and make different words and have family members close their eyes and feel these letters and spell out words. ● Spelling and writing each letter takes a long time, so instead you can think of each letter being represented by a different number of small holes that can be felt. These holes can be made by poking them into paper with a pencil tip. For example, the letter A has one

hole, the letter B has two holes one on top of the other, the letter E as two columns of holes, etc.

20 minutes

- Write a word in your “braille” language. Create a cheat sheet to show which letter has how many holes in what pattern. Ask family members to decode this by feeling the holes and looking at the cheat sheet.

DAY 4

Today you will explore code numerical languages.

Suggested Duration	Activity and Description
5 minutes	<ul style="list-style-type: none"> ● First say or write a few ideas about how you would write something in a code language that no one else can easily decipher or read.
15 minutes	<ul style="list-style-type: none"> ● Explore numerical substitutions. ● Develop a code. ● Write an entire sentence with this code. <ul style="list-style-type: none"> - If A = 1, B = 2, C = 3 and so on. How will you write the word BAD i.e. B=2, A=1 and D = 4 so we get 2.1.4, ● Write an entire sentence with this code.
30 minutes	<ul style="list-style-type: none"> ● Now create a different numerical code, some ideas of variations include: <ul style="list-style-type: none"> - Only even or odd number - Skip every number ending with 7 - Use increments of 2, 3, or 5 etc. e.g. if you use table 3, A is 3, B is 6 and so on - Make the vowels the first 5 prime numbers (2, 3, 5, 7 and 11. A prime number is an integer, or whole number, that has only two factors — 1 and itself. Put another way, a prime number can be divided evenly only by 1 and by itself. Prime numbers also must be greater than 1) - All numbers divisible by 2 and 6 ● Make your own code, write a sentence in code and also the code-breaker that shares the code.
15 minutes	<ul style="list-style-type: none"> ● Write a letter with invisible ink. ● Put some lemon juice into a cup and dip a cotton ear bud in this as ink (if there is no cotton ear bud put some cotton at the tip of your pencil or a matchstick) and trace a message on a paper with the

lemon juice. Once the paper dries learners will not be able to see the message.

- In order to see the message need to ask an adult to hold the paper on something hot e.g. hold it on a hot bulb or run an iron over it (but not a steam iron) ***Please be careful when using the hot objects.**
The letters will begin to appear in a lightly dark / burned color
- Another way to read the lemon juice message is to put salt on the drying juice. After a minute, wipe off the salt and then use a wax crayon to reveal the message.
- The science behind the experiment:
 - The message discolors before the rest of the paper gets hot enough to do so. When you wrote your message using the lemon juice, carbon-based compounds in the juice were absorbed into the paper's fibers. Heat breaks down these compounds and releases the carbon. When the carbon came into contact with air, it oxidized. One effect of oxidation is that things turn a darker color.

10 minutes

- Explore the effects of oxidation as sometimes this does not need heat to occur e.g. leave a peeled bite of apple, banana or pear on a plate out for a while. The fruit will start to look brown due to the air – experiment with:
 - Different types of fruit and different solutions to note the differences and fill out the table below.

	Fruit	Air	Lemon Juice	Saltwater	Water
1	Apple	Learners will write their observation of oxidation here			
2					
3					

- Optional: try to reserve the oxidation process by placing some copper coins in a water and vinegar solution. Notice that this makes them shinier because of the effect of vinegar on removing the copper oxide on them.

5 minutes

- Write the steps and explanation for invisible ink for someone to understand and conduct the experiment.

DAY 5

Today you will write a secret code of your own!

Suggested Duration	Activity and Description
30 minutes	<ul style="list-style-type: none"> Hide six objects of your choice anywhere in your home and have family members find these using your own code oral language and code written language For the code oral language, learners will make one code to find object 1 using alien or made-up words. To find object 2, learners will sign out the clue to family members For the code written language: For object 3 learners can use “braille, for object 4 they can use numerical substitution, for object 5 they can use glyphs and for object 6 they can use invisible ink”
20 minutes	<ul style="list-style-type: none"> Ask family members to break these codes and then find the six objects they have hidden.
5 minutes	<ul style="list-style-type: none"> Reflect on the power and evolution of language and write your own reflections based on what you thought was the most interesting for yourself.

ASSESSMENT CRITERIA

- Creativity in developing their own alien words, glyphs and signs
- Clarity of writing and drawings in letters
- Understanding demonstrated when sharing the scientific experiment of oxidation
- Critical thinking in ciphering and deciphering
- Ability to write code breakers especially for the “braille” and “numerical patterns”

MODIFICATIONS FOR SIMPLIFICATION

- Learners can focus on the instructions and cues given and not design their own codes