

## CODE LANGUAGES






### Ages 4 to 7 (Level 1)

<b>Description:</b>	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
<b>Leading question:</b>	Can you write a letter in a hidden code language?
<b>Age group:</b>	4 – 7 years
<b>Subjects:</b>	Language Arts, Numeracy and
<b>Total time required:</b>	5 hours over 5 days
<b>Self-guided / Supervised activity:</b>	Low Supervision
<b>Resources required:</b>	Paper, Pencil, Eraser, Dough

Day	Time	Activity and Description
1	10 minutes	Learners will begin by exploring and understanding the history of languages  Learners will begin to think of how many languages they can speak, read and write and: <ul style="list-style-type: none"> <li>- Write or say out loud the same word in the different languages that they 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?</li> <li>- Write the same alphabets in multiple scripts, for example: what would the letter A, B, C be in the other language’s script</li> <li>- 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</li> <li>- Do you know that language is also 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</li> </ul>
	20 minutes	Learners will end this activity designing 5 – 10 of their own alien or “made-up” words. These words can represent an emotion that they do not think there is a word for e.g. when you are angry because you are sleepy.
	15 minutes	



	<p>30 minutes</p>	<p>Learners will play a game of Pictionary with their family members:</p> <p>Preparation:</p> <ul style="list-style-type: none"> <li>- 10 cards with words to be drawn e.g. Flower, Horse, Computer etc.</li> <li>- 2 or more teams with each team having 2 or more members</li> <li>- Paper, pencils and erasers or a board and chalk to draw</li> <li>- A paper with a points column for each of the teams</li> </ul> <p>Rules:</p> <ul style="list-style-type: none"> <li>- One team member from each team will pick 3 cards</li> <li>- The same team member will draw each of the words on the cards</li> <li>- The other team member will guess the word based on the picture</li> <li>- Each team gets as many points as the words they guess, with the maximum being 3 points per round</li> </ul> <p>Learners will add the total after playing one or two rounds of the game and compare the larger number to decide who won the game</p> <p>Optional: To have an extension of the game, the cards can have full sentences that have to be drawn and guessed using glyphs.</p>
<p>3</p>	<p>10 minutes</p>	<p>Today the learners will explore how language works for those with compromised vision or total blindness and similarly with those that are unable to hear</p> <p>Learners will think of how you can communicate with someone who is deaf and cannot hear. Learners can put some cotton in their own ear and ask family members to whisper to be able to relate with the deaf. Perhaps they will begin to read people's lips and guess the words they are saying or they find that family members are using their hands to gesticulate and act words out.</p> <p>Sign language is the visual-manual language of those with hearing issues – people make words and letters using their hands.</p> <p>Examples:</p>

		<p>eat / food    bathroom</p>  <p>help</p>  <p>finished</p>  <p>more</p>  <p>play</p>  <p>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.</p> <p>Learners will think of signs for 5 of the most common words they use. They can now try and do a sentence by acting it out / signing it out</p> <p>Learners can play a game of Charades to understand communication by signing and acting out.</p> <p>Preparation:</p> <ul style="list-style-type: none"> <li>- 10 cards with words to be acted / signed out e.g. Flower, Bird, Hungry etc.</li> <li>- 2 or more teams with each team having 2 or more members</li> <li>- Paper, pencils and erasers or a board and chalk to draw</li> <li>- A paper with a points column for each of the teams</li> </ul> <p>Rules:</p> <ul style="list-style-type: none"> <li>- One team member from each team will pick 3 cards or think of other words to act out</li> <li>- The same team member will act each of the words on the cards</li> <li>- The other team member will guess the word based on the acting</li> <li>- The team member acting out the words is not allowed to use verbal clues</li> </ul> <p>Each team gets as many points as the words they guess, with the maximum being 3 points per round</p> <p>Learners will add the total after playing one or two rounds of the game and compare the larger number to decide who won the game</p>
5 minutes		
10 minutes		
30 minutes		

	5 minutes	Learners will explore how blind people read since they cannot see words or letters. Learners can think of how they would help blind people read and write or say a few ideas
	15 minutes	Learners will then explore the concept of Braille, which is a written language that the blind can read through touching the letters  Learners will use flour dough or playdough to make letters and words. They can ask family members to close their eyes and feel these. Learners can also write letters and poke holes in the paper and flip it to touch the protruding parts and “feel out” the letters
4	5 minutes	Today learners will explore code numerical languages.  Learners can first say or write a few ideas about how they would write something in a code language that no one else can easily decipher or read
	15 minutes	Learners will explore numerical substitutions  Learners will develop a code 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,
	10 minutes	Learners will write the entire code e.g. what letters = which number  Learners will then write an entire sentence or words with this code
	30 minutes	Now create a different numerical code, some ideas of variations include: <ul style="list-style-type: none"> <li>- Every letter is +2 from the previous letter e.g. A = 2, B= 2+2=4, C=4+2=6 etc.</li> <li>- Every letter is -3 from the previous letter e.g. Z = 100, Y= 100-3=97, X=97-3=94</li> <li>- Only even or odd number</li> <li>- Every letter is a number that ends with 10 e.g. A=10, B=20 etc.</li> </ul> Learners will make their own code, write a sentence in code and also the code-breaker that shares the code
5		Learners will write a secret code of their own choice today.

40 minutes	Learners will hide two objects of their choice anywhere in their home and have family members find these using their own code oral language and code written language
15 minutes	Learners will ask family members to break these codes and then find the two objects they have hidden
5 minutes	Learners will reflect on the power and evolution of language and write their own reflections based on what they thought was the most interesting for themselves
Assessment Criteria:	<ul style="list-style-type: none"> <li>- Creativity in developing their own alien words, glyphs and signs</li> <li>- Clarity of writing and drawings in letters</li> <li>- Critical thinking in playing the games and ciphering and deciphering words</li> <li>- Ability to write code breakers especially for the “numerical patterns”</li> </ul>

Learning outcomes:	<ul style="list-style-type: none"> <li>- Understanding of the history and evolution of language especially from oral to written language</li> <li>- Understanding the different types of language for those with visual or auditory impairments</li> <li>- Understanding numerical concepts and patterns through written language</li> </ul>
Required previous learning:	- Knowledge of the alphabet
Inspiration:	None
Additional enrichment activities:	None
Modifications to simplify the project tasks if need be	Learners can focus on the instructions and cues given and not design their own codes


## Ages 8 to 10 (Level 2)


<b>Description:</b>	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
<b>Leading question:</b>	Can you write a letter in a hidden code language?
<b>Age group:</b>	8 – 10 years
<b>Subjects:</b>	Language Arts, Numeracy and
<b>Total time required:</b>	5 hours over 5 days
<b>Self-guided / Supervised activity:</b>	Low Supervision
<b>Resources required:</b>	Paper, Pencil, Eraser, Dough, Lemon Juice, Cotton and Matchstick, Fruit, Salt, Water

Day	Time	Activity and Description
1	20 minutes	<p>Learners will begin by exploring and understanding the history of languages</p> <p>Learners will begin to think of how many languages they can speak, read and write and:</p> <ul style="list-style-type: none"> <li>- Write the same word in the different languages that they 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 them in the 2 – 3 languages you know?</li> <li>- Write the same word in multiple scripts, for example: your name and explore if there are any alphabets missing in the different scripts to be able to pronounce words accurately</li> <li>- 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</li> <li>- Do you know that language is also 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 cybersecurity was added as this new concept based on the development of internet and computers</li> </ul>

	20 minutes	Learners will end this activity designing 5 – 10 of their own alien or “made-up” words. These words can represent an emotion that they do not think there is a word for e.g. when you are angry because you are sleepy.
	10 minutes	Learners will begin to explore how oral language evolved and the importance of writing: <ul style="list-style-type: none"> <li>- 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</li> </ul>
	15 minutes	Chinese Whispers: Learners will listen to a story from someone in the family (please make sure this is not a common story that people know from before) They will re-narrate this story to another family member. The third family member will narrate this story forward to another family member. Learners will reflect on what and how much this story changes as more and more people hear and retell it?
	10 minutes	Rhyming Verse: Learners will now convert the same story in verse and give it a beat. learners can 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	Learners will practice oral memory using a long number – this can be a random phone number or the full birthday or phone numbers of 2 people together (again it is important that this is not a familiar number or a familiar sequence).  Learners are not allowed to write this number down anywhere and we will test if they remember it tomorrow
2	5 minutes	Learners will begin the day by recalling the number. They will then reflect on how difficult it is and write a short paragraph on the reason that written language evolved and what are things that are important to record accurately. Prompts include accounts / numbers, medical procedures etc.
	15 minutes	Learners will begin to explore 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.



<p>15 minutes</p>		<p>Learners will make glyphs of 10 common words. Learners should 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 or replicate</p> <ul style="list-style-type: none"> <li>- Two weather elements e.g. Rain and Wind</li> <li>- Two animals e.g. Dog and Parrot</li> <li>- Two places e.g. Home and School</li> <li>- Two people e.g. Mother and Friend</li> <li>- Two objects e.g. A Toy and Car</li> </ul> <p>Learners will write a short 5 sentence story in glyphs</p> <p>Learners will play a game of Pictionary with their family members:</p> <p>Preparation:</p> <ul style="list-style-type: none"> <li>- 20 cards with words to be drawn e.g. Flower, Horse, Computer etc.</li> <li>- 2 or more teams with each team having 2 or more members</li> <li>- Paper, pencils and erasers or a board and chalk to draw</li> <li>- A paper with a points column for each of the teams</li> </ul> <p>Rules:</p> <ul style="list-style-type: none"> <li>- One team member from each team will pick 5 cards</li> <li>- The same team member will draw each of the words on the cards</li> <li>- The other team member will guess the word based on the picture</li> <li>- Each team gets as many points as the words they guess, with the maximum being 5 points per round</li> </ul> <p>Optional: To have an extension of the game the cards can have full sentences that have to be drawn and guesses using glyphs</p>
<p>3</p>	<p>5 minutes</p>	<p>Today the learners will explore how language works for those with compromised vision or total blindness and similarly with those that are unable to hear</p> <p>Learners will think of how you can communicate with someone who is deaf and cannot hear. Learners can put some cotton in their own ear and ask family members to whisper to be able to relate with the deaf. Perhaps they will begin to</p>

	<p>5 minutes</p> <p>15 minutes</p> <p>30 minutes</p>	<p>read people's lips and guess the words they are saying or they find that family members are using their hands to gesticulate and act words out.</p> <p>Sign language is the visual-manual language of those with hearing issues – people make words and letters using their hands.</p> <p>Examples:</p>  <p>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.</p> <p>Learners will think of signs for 5 of the most common words they use. They can now try and do a sentence by acting it out / signing it out</p> <p>Learners can play a game of Charades to understand communication by signing and acting out.</p> <p>Preparation:</p> <ul style="list-style-type: none"> <li>- 20 cards with words to be acted / signed out e.g. Flower, Bird, Hungry etc.</li> <li>- 2 or more teams with each team having 2 or more members</li> <li>- Paper, pencils and erasers or a board and chalk to draw</li> <li>- A paper with a points column for each of the teams</li> </ul> <p>Rules:</p> <ul style="list-style-type: none"> <li>- One team member from each team will pick 5 cards</li> <li>- The same team member will act each of the words on the cards without using verbal clues</li> </ul>
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	5 minutes	<p>- The other team member will guess the word based on the acting</p> <p>Each team gets as many points as the words they guess, with the maximum being 5 points per round</p> <p>Learners will explore how blind people read since they cannot see words or letters. Learners can think of how they would help blind people read and write a few ideas</p> <p>Learners will then explore the concept of Braille, which is a written language that the blind can read through touching the letters</p> <p>Learners will use flour dough or playdough to make letters and words. They can ask family members to close their eyes and feel these</p> <p>Similarly, they can write letters on a thick paper and make different words and have family members close their eyes and feel these letters and spell out the words</p>
	10 minutes	<p>Spelling and writing each letter takes a long time, so instead learners 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 a paper with a pencil/pen tip e.g. 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.</p> <p>Learners can write a word in their “braille” language. Learners will create a cheat sheet to show which letter has how many holes in what pattern. Learners can ask family members to “decode” this by feeling the holes and looking at the cheat sheet.</p>
	20 minutes	
4	5 minutes	<p>Today learners will explore code languages.</p> <p>Learners can first think and write a few ideas about how they would write something in a code language that no one else can easily decipher or read</p>
	10 minutes	<p>Learners will explore numerical substitutions</p> <p>Learners will develop a code If A = 1, B = 2, C = 3 and so how will you write the word BAD i.e. B=2, A=1 and D = 4 so we get 2.1.4,</p> <p>Learners will write an entire sentence with this code</p>
	15 minutes	<p>Now create a different numerical code, some ideas of variations include:</p>

	<p>15 minutes</p>	<ul style="list-style-type: none"> <li>- Only even or odd number</li> <li>- Skip every number ending with 7</li> <li>- Use increments of 2, 3, or 5 etc. e.g. if you use table 3, A is 3, B is 6 and so on</li> <li>- 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)</li> <li>- All numbers divisible by 2 and 6</li> </ul> <p>Learners will make their own code, write a sentence in code and also the code-breaker that shares the code</p> <p>Write a letter with invisible ink</p> <p>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.</p> <p>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) <b>*Please be careful when using the hot objects.</b> The letters will begin to appear in a lightly dark / burned color</p> <p>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.</p> <p>The science behind the experiment:</p> <p>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.</p> <p>Learners will 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 – learners can experiment with:</p> <ul style="list-style-type: none"> <li>- Different types of fruit and different solutions to note the differences and fill out the table below</li> </ul> <table border="1" data-bbox="418 1780 1356 1852"> <tr> <td></td> <td>Fruit</td> <td>Air</td> <td>Lemon Juice</td> <td>Saltwater</td> <td>Water</td> </tr> </table>		Fruit	Air	Lemon Juice	Saltwater	Water
	Fruit	Air	Lemon Juice	Saltwater	Water			
	<p>10 minutes</p>							

		<table border="1"> <tr> <td>1</td> <td>Apple</td> <td>Learners will write their observation of oxidation here</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Optional: Learners can try to reverse the oxidation process by placing some copper coins in a water and vinegar solution. They will notice that this makes them shinier because of the effect of vinegar on removing the copper oxide on them.</p> <p>Learners will write the steps and explanation for invisible ink for someone to understand and conduct the experiment</p>	1	Apple	Learners will write their observation of oxidation here				2						3					
1	Apple	Learners will write their observation of oxidation here																		
2																				
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5	30 minutes	<p>Learners will write a secret code of their own choice today. Learners will hide six objects of their choice anywhere in their home and have family members find these using their own code oral language and code written language</p> <ul style="list-style-type: none"> <li>- 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</li> <li>- 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”</li> </ul>																		
	20 minutes	Learners will ask family members to break these codes and then find the six objects they have hidden																		
	5 minutes	Learners will reflect on the power and evolution of language and write their own reflections based on what they thought was the most interesting for themselves. They will also observe the codes that were harder to break																		
Assessment Criteria:		<ul style="list-style-type: none"> <li>- Creativity in developing their own alien words, glyphs and signs</li> <li>- Clarity of writing and drawings in letters</li> <li>- Understanding demonstrated when sharing the scientific experiment of oxidation</li> <li>- Critical thinking in ciphering and deciphering</li> <li>- Ability to write code breakers especially for the “braille” and “numerical patterns”</li> </ul>																		

Learning outcomes:	<ul style="list-style-type: none"> <li>- Understanding of the history and evolution of language especially from oral to written language</li> <li>- Understanding the different types of language for those with visual or auditory impairments</li> <li>- Understanding numerical concepts and patterns through written language</li> </ul>
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Required previous learning:	None
Inspiration:	None
Additional enrichment activities:	None
Modifications to simplify the project tasks if need be	Learners can focus on the instructions and cues given and not design their own codes