MY PLACE VALUE MACHINE? (LEVEL1)

Ages 4 to 6 (Level 1)

Description:	Learners will design their own place value machine to gain a deeper understanding of number bonding and learn to recognize and understand place value.
Leading question:	**How many tens of chocolates do you need to have 30 chocolates?**
Age group:	4-6
Subjects:	Math, English
Total time required:	75 minutes over 3 days
Self-guided / Supervised activity:	Medium
Resources required:	Papers, pencil, counters (stones, sticks, buttons, leaves any small items), glue, cardboard, colors and scissors, 10 balloons. Beads or buttons (two different colors), threads, cardboard, dice, chalk.

Day	Time	Activity and Description
1		This project should be done after completing the project "Bonding with numbers"
	10 minutes	Introduction Ask the learner: - What number comes after 13? - What number comes before 19? - Write all numbers from 10 to 20.
	20 minutes	The learner will collect 20 objects to count with (such as stones, sticks, buttons, leaves or any other small items that can be used as counters/counting objects). With help of an adult, he/she will draw the following table to create number bonds for all numbers from 11 to 20. The learner will divide the number into 10 + another number. For example, 11 will be 10 + 1, 12 is 10 +2 etc.

The whole	Part 1	What will be part 2
11 counters	10	1
12 counters	10	2
13 counters	10	3
14 counters	10	?

	10 minutes	Explain: from the above activity we can see that each number is made up of two digits. Numbers like 6 and 7 that have one digit have one place called the ones place. For numbers that have two digits, the digit on the right is in the ones place and the digit on the left is in the tens place. For example, 12 has two ones and one ten. The learner will complete the following table and identify the place value of numbers 10-19 TABLE_BELOW
	20 minutes	Balloon race game - learners can play the following game to practice place value: - Family members and learners will inflate 12 balloons and write numbers 1 to 9 on the balloons. They will write numbers 2-9 once on each balloon but number 1 will be repeated 3 times (on 3 different balloons). - Two players or more can play this game. One player shouts out a number from 11-19 and asks other players to collect two balloons - one balloon will have a number that will go in the ones/units place and the other will have a number that will go in the tens place. Together the two numbers should form the number that the first player shouted out - The first to collect the right balloons wins - Example: Player 1 shouts: "form a number which has one ten and five units/ones" so the players run and race each other to collect the balloons with one and five. The first player to get the right balloons wins. Players can get points for getting the balloons first. The player with the highest score at the end of the game wins.
	20 minutes	Place value machine: - Materials: 40 buttons or beads of two different colors (30 of the same color for tens + 10 in another color for the ones); 5 threads/strings 15 cm in length

Number	Tens	Ones
10	1	0
11	1	1
12	1	2

- To make the machine, learners will pass 10 beads or buttons through one thread/string with the help of an adult. They can make knots on either side of the thread so that the beads/buttons stay in place.
- Learners fold a piece of paper vertically into two parts - one part will be the tens column and the other will be the ones/units column. They will represent numbers 10-19 using the beads/buttons and use one color for tens and another for the ones.
- Example: ask the learner to represent 16. On the tens column he/she will place one thread with 10 beads & on the ones column he/she will place 6 individual beads. See the image below for reference
- Learners will use the same machine to represent the place value for numbers 20-30 & 30-40 in day 2 & day 3 .

Literacy extension: Introduce how to write numbers 11-20 in words. Use dotted lines that learners can trace to help them practice writing:

11	eleven
12	Twelve
13	Thirteen

2		Today Learners will be able to
		- Write & count from 20 to 30
		- Recognize the place value (ones & tens place) for numbers 20-30.
	10 minutes	Learners will play the following 2 players game to review counting numbers 1-20:
		- Learners will draw a 1-20 number line on the ground with the help of an adult
		- Each player will have a counter that can be colored stones, differently colored buttons, small toys etc. Each number will be written inside a circle so that learners can place their counters inside.
		- Both players start at the highest number on the number line (i.e. 20).
		- Players take turns rolling the dice and moving their counters back according to the number they get on the dice.
		- The player who gets their counter to zero first wins.
	20 minutes	Introduce how to write & count numbers 21 to 30:

		- Explain that 21 is 2 & 1, 22is 2 &2 etc.
		- Ask learners to write each number (21 up to 30) 10 times.
	20 minutes	The learner will collect 30 dry leaves or (any small and light objects like colored pieces of paper) and glue them onto a piece of cardboard. He/she will then write numbers 1-30 under the leaves using chalk or crayons. Write 1 under the first leaf, 2 under the second leaf etc. until he/she reaches number 30
	15 minutes	Learners will collect 30 counters (stones, sticks, buttons, leaves etc.). With the help of an adult, learners will draw the following table to sort numbers 21-29 into tens & ones

Learners will first identify how many tens are in the number and the rest will be ones. For example, 21 has two 10s and one 1 (21 = 10 + 10 + 1)

Whole Number	Tens	Ones
21	10+10	1
22	10+10	2
23	10+10	3
……..	10+10	---

By the end of the activity, learners will discover that there are two tens in numbers 20-29.

Learners will draw another table with help of an adult to sort out the place value of numbers 20-29 by writing only the number of tens and ones

Number	Tens	Ones
20	2	0
21	2	1
22	2	2

15 minutes

Place value machine:

|		
		- Repeat the same place value machine activity on day 1 but instead of one thread with ten beads in the tens column, use **two threads** with ten beads each to represent 20 - Learners will fold a piece of paper vertically into two parts and use one side to represent tens and the other for ones. Numbers 20-29 will be represented using two threads with ten beads in the tens column and individual beads of a different color for the ones/units. - Example: an adult asks learners to represent number 24 using place value. On the tens column, they will place two threads each containing 10 beads and on the ones column they will place 4 individual beads. See the image below - Learner will use the same machine to represent the place value for numbers 20-29 Literacy extension: Introduce how to write numbers 20-29 in words: | 20	Twenty
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21	Twenty one
22	Twenty two	

3		Learner will be able to:
		    - Write & count from 30 to 39
		     -Recognize the place value (ones & tens) of numbers 30-39

	15 minutes	Introduction: Learners will play a ones & tens game with family members: - Each player will have 30 counters/counting objects - An adult shouts a number between 10-30 and asks players to use counters to count this number then split the counters into ten/tens and ones. For example, an adult shouts 15, and players should count 15 counters quickly then split 10 counters for tens and 5 counters for the ones place. - The first to correctly count and place counters into tens and ones wins - Repeat the activity for different numbers between 10 -30.
	25 minutes	- Introduce how to write and count numbers 31-40 following the same steps as the previous days (31 is 3 and 1 etc.). Ask learners to write each number from 31-40 10 times

		- Learners collect 30 thin sticks so they are easy to break into different sizes. They will then use those sticks to form numbers 30-40. See the image below for reference
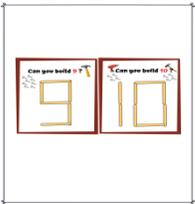
- Next, learners draw the following table with the help of an adult. Alternatively, they can fold a paper vertically into 3 parts and create the three columns below. They will use the table to sort out the place value of numbers 30 to 39

Example:

Number	Tens	Ones
30	3	0
31	3	1

Literacy extension: Introduce how to write numbers 30-39 in words.

30	Thirty
31	Thirty one
32	Thirty two

Standard vs expanded form:

Explain to learners that we can write numbers in the standard form or the expanded form. The standard form for thirty-six is 36 and the expanded form is 30 + 6

Other examples:

Number in words	Number in standard form	Number in expanded form
Twenty five	25	20 + 5
Sixteen	16	10 + 68

Activity:

(Time column: 15 minutes, 15 minutes, 15 minutes)

- The learner will choose any number between10-40 and use a cardboard to draw and show his/her number in three forms (in words, standard & expanded form) in a creative way.
- The learner will share his/her poster with family members or class explaining the three forms.
- Samples of posters below:

Place value machine:
- Repeat the same place value activity on day 1 but instead of one thread with ten beads or buttons, learners will use 3 threads with 10 beads each
- Learners will fold a piece of paper vertically into two parts and will use one part as the tens column and the other as the ones column. They will represent numbers 30-39 using three beaded threads for tens (10 + 10 + 10) and individual beads for the ones depending on the number.
- Example: An adult asks the learner to represent 37 using place value. On the tens column, he/she will place three beaded threads, and on the ones column 7 individual beads
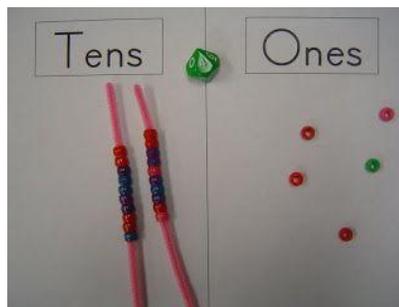
Learners present their place value machine to their friends, family members, or class and demonstrate how to show the place value of numbers 10-40

Assessment Criteria:	1. Counting and writing numbers up to 40 accurately
	2. Creativity in designing the number forms poster
	3. Recognizing number forms of numbers 10-40 accurately

| | 4. Recognizing the place value of numbers 10 to 40 accurately |
| | 5. Communication skills in presenting the place value machine |

Learning outcomes:	Learner will be able to: - Count & write numbers 21-to 40 - Recognize the place value of numbers 10-40 - Write numbers 11-40 in words. - Recognize the difference between standard form and expanded form
Required previous learning:	Write & count numbers up to 20
Inspiration:	The image of place value machine https://www.pinterest.com/pin/68722893367/ Samples of posters day3https://www.pinterest.com/pin/489907265685839527/ Day 2 review of counting 1-20 https://earlyimpactlearning.com/18-counting-backwards-activities/
Additional enrichment activities:	Learners can sort out the place values & expanded form of numbers 50-100
Modifications for simplification:	Learners can limit the project to the activities that involve sorting numbers into tens and ones and skip the other activities including the expanded form, literacy extensions etc.