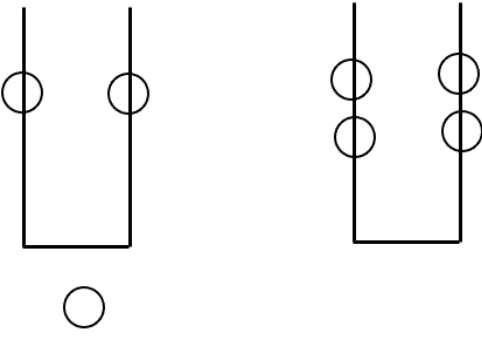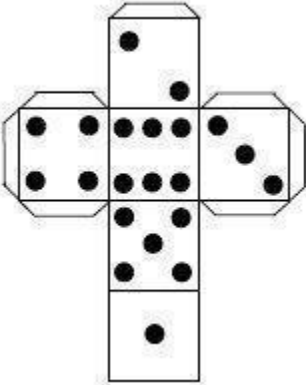# JUMPING MATH

Ages 4 to 7 (Level 1)

Description:	Learner will design their own number line game to get a better grasp of number sense and conduct simple addition and subtraction functions
Leading question:	Can you make your own number line?
Age group:	4 - 7 years old
Subjects:	Math Art and Design Physical Activity
Total time required:	6 hours total over 5 days
Self-guided / Supervised activity:	Supervision by parents / guardians
Resources required:	Paint, Paper, Scissors, Cardboard

Day	Time	Activity and Description
1	10 minutes	Learners will revise counting the numbers from 0 – 20, they can count different objects in their house to revise this – trying to count both forward and backwards from 20
	10 minutes	Learners will perform the following experiment to help them learn about even numbers and odd numbers. ● Learners will obtain some items at home e.g., pens, pencils, spoons, folks, boxes etc. or anything else available at home. Take note of the number of items available for each of the items. You can use a table like the one below: {table}

Table inside:

Item	Number available
Pens	3
Boxes	2
Spoons	5

- Find two people within your home/community
- Distribute the items equally among the two people. *What do you observe?* **Hint:** some items can be divided equally among the two people, and some may not.
- The number of items that can be split into two parts equally as a whole is an even number and the number that cannot be split in two parts equally as a whole number is an odd number

Tip: Younger learners that may not understand the concept of a whole number should be told that no halving is allowed.

Example:
- 2 pencils can be distributed to two people as 1 goes to X and 1 goes to Y with none left over – so it is an even number
- 3 boxes get distributed to two people as 1 goes to X and 1 goes to Y, but then there is 1 leftover, and it can only be divided if we split it into half (which is not allowed) – so 3 is an odd number

30 minutes

Learners will identify which numbers between 1-20 are odd or even by doing the same experiment above but using two sticks this time and placing an equal number of balls on each of the sticks:

For example, for the numbers, 3 and 4.

Because 3 cannot be equally distributed into the two sticks, it is an odd number and because 4 can be distributed between the two sticks equally then it is an even number.

Learners should now do this for all the numbers from 1-20.

They should reach the result that $2 – 4 – 6 – 8 – 10 – 12 – 14 – 16 – 18 – 20$ are even numbers and the odd numbers are $1 – 3 – 5 – 7- 9 – 11 – 13 – 15 – 17 – 19$

		Learners will design their own number line: They will paint, write and cut out each of the numbers from 0 – 20 and stick them in order on the ground
	20 minutes	The even numbers will be in one color and the odd numbers will be in another color

See example below:

1

2

3

4

5

6

7

8

9

10

TIP: If you have tiles at home – please ask them to place a number in each tile or measure equal distances between the numbers being stuck.

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2	30 minutes	Learners will make their own dice based on their understanding of a cube.

Input: A cube is a three-dimensional solid object bounded by six square faces, with three meeting at each vertex/corners.

- Learners can identify other cubes in their home (e.g. ice cubes, sugar cubes, square boxes etc.). Ask the learner to think about what is unique about the cube? What shapes do they see in the cube? How many sides does it have? And write the description of a cube and draw the same.

- Learners will identify the different squares in the cube and count and draw these with equal length of 4 sides

- Learners will also identify rectangles at home and draw these to see the difference between the square and the rectangle

- Learners can design and draw the below to make their own dice, the lines will be folded and stuck together in the shape of a cube

Alternatively,

- Learners will design the spinning wheel for the game.

Input: A spinning wheel is a circle or round and looks a little like a clock. Like the hands of a clock, we have to design a hand or arrow that we can spin and will land on one choice

- To design the spinning wheel, ask learners to think about a clock. What do they observe about the clock? What is the shape of the clock? What about the moving sticks? So a spinning wheel is like a clock.

- Learners can use any round object to trace out a large circle. They will then make 6 sections to the circle

TIP: Please see below as a reference and learners can understand imagining the circle is one big pizza or cake and you had to cut 6 pieces of the pizza)

- Learners will now create the spinning arrow – which could be a paper clip that is inserted in a paper pin that is inserted into the center of the circle as below

Alternatively, the learners can cut out an arrow on cardboard or thick paper and then insert this into the center of the circle using an opened paper clip or paper pin.

Learners will now write all the numbers down and cut them into small cards.

See example below:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

Learners will also write the main mathematical functions on separate small cards (+ addition / - subtraction / > greater than / < less than)

For example

+	-	x	÷
Less than (<)	Greater than (>)	Equal to (=)	

	10 minutes	**Critique and Revision:** Learners can reflect and identify the shapes they identified today in their homes such as an ice cube, or a pizza / flatbread / clock divided into many sections. Based on these alternate objects, can they improve the design of what they have designed?
3	45 minutes	All the preparations are now ready to play the addition game! Rules: Learners will throw the dice or spin the spinner and based on the number that comes, they have to jump that many places UP the number-line. Learner will start from 0 (e.g. if the dice is 3, they will jump up 1..2..3 to number 3, then throw the dice and if it is 5 – they will jump up to 8 (3+5 or 4..5..6..7..8) Learner will also complete a numerical representation by writing down the sums that they are practicing e.g., 3+5=8
	15 minutes	Family members will pick up a number card. Ask the learner to compare the two numbers (the number the learner is standing on and the number the family member is holding). What can they say about the two numbers? Is one number less than (<), greater than (>) or equal to (=) the other? Learners can come up with rules on how to play the game based on the number selected. Examples: ● If you land on a number is less than – you have to jump forward 2 steps ● If you land on a number is greater than – you have to jump forward 3 steps ● If you land on a number equal to, …. Learner can add rule here Example: Family member picks up a number 4, if the learner happens to be standing on 6, since 6 is greater than 4 - the learner gives the family members an exercise to do

		Learners will represent this in a numerical function as 6 > 4 using the number cards and the mathematical functions cards. Extension: Learners can do the number of exercises as the number is greater than e.g. 13 − 8 = 5 so 5 jumping jack exercises
4	45 minutes	All the preparations are now ready to play the subtraction game! Rules: Learner will throw the dice or spin the spinner and based on the number that comes, they have to jump the same number of places DOWN the number line. Learner will start from 20 (e.g. if the dice is 3, they will jump down to 17 (20–3), then throw the dice and if it is 5 they will jump down to 12 (17-5) Learner will also complete a numerical representation by writing down the sums that they are practicing e.g. 20 − 3 = 17
	15 minutes	Family members will pick up a number card. Ask the learner to compare the two numbers (the number the learner is standing on and the number the family member is holding). What can they say about the two numbers? Is one number less than (<), greater than (>) or equal to (=) the other? Learners can come up with rules on how to play the game based on the number selected. Examples: ● If you land on a number is less than – you have to jump forward 2 steps ● If you land on a number is greater than – you have to jump forward 3 steps ● If you land on a number equal to, …. Learner can add rule here Example: Family member picks up a number 13, if the learner happens to be standing on 8, since 8 is less than 13 - the learner gives the family members an exercise to do Learners will write and represent this numerically as 8 < 13 or can use the number cards and the mathematical functions cards. Extension: Learners can do the number of exercises as the difference between the numbers e.g. 13 − 8 = 5 so 5 jumping jack exercises
5	45 minutes	Continue to play the game with any or all four numerical operations with your own rules (addition, subtraction, multiplication and division – depending on the learner levels) Suggested Rules 1:

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		Family members can pick up a function card and a number card. Learners will then perform the operation e.g. x6, - 3, and then determine is the final number greater or lesser than the original number they started with
		Learners will write down all the mathematical functions numerically
		Learners can add in rules – examples include: ● if you land on an even number – you have to jump that many times or if you land on an odd number – you have to hop that many times ● Extra points for identifying different ways to reach the same number e.g. 7+3 = 10, 5+ 5 = 10 and 14 – 4 = 10. They can try all these out on the number line
	15 minutes	Overall Project Reflection: The learner will now think about all the exercises they have done all week and take note of "TWO" of the following: • What is the most important lesson you have learnt through this project? • What are you found challenging, puzzling or difficult to understand? • What question would you most like to discuss? • What is something you found interesting? • Is there any new math trick or rule you learned?
Assessment Criteria:		- Understanding of shapes and ability to identify them - Design of the dice - Clarity of the painting and formation of the numbers and numerical representation of the sums - Deeper number sense

Topics/concepts covered	- Odd-even numbers - Addition, subtraction, division and multiplication - Mathematical operations (less than, greater than, equal to) -
Learning outcomes:	- Understanding odd-even numbers - Describe a simple relationship between two numbers using appropriate mathematical terms. (Greater than, less than or equal to) - Understand place value in and order whole numbers

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	- Represent the place value of two-digit numbers (tens and ones) using real objects, models and expanded notation - Add, subtract, multiply and divide whole numbers
Required previous learning:	Awareness of numbers from 0 – 20 and being able to write the numbers
Inspiration:	None
Additional enrichment activities:	- Design the number line for going to – 10 - Design the number line for 30 - 50 - Introduce patterns and more rules to start understanding multiplication e.g. students asked to jump on every alternate number e.g. 2 – 4 – 6 – 8 – 10 etc. and write down 2+2=4, 4+2=6, 6+2=8 etc. A similar exercise can be done for patterns for the 5 and 10 times table - Learners can begin to write inverse operations.

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