20 Steps To Learning Math

40 Games - 2 per Step - you play your child to skill in Math

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Carlito C. Caterpillar's Math House Games™

Based on Domenico Marcario's Sensory Math Teaching System

Stage 1: Quantity *Steps 1 thru 10*

The ability to *imagine* a number is the key to learning math. A student who can *sight* amounts of objects will, later on, be able to deal with numbers more effectively than his/her counterpart who sees a number only as a *symbol*. While the imaginative student counts by grouping objects, the less imaginative one counts by ones using fingers. While one develops a mental network to discover math on his/her own initiative, the other relies heavily on rote *memorization* and *other people* to learn concepts.

The 10 steps of Stage 1 immerse the learner in playful activities that enable a student to develop the necessary skills to *imagine*, to *see*, and to *feel* the numbers from *0 to 10*,and, most importantly, to establish a strong *math foundation*.

Stage 1: Quantity

Step 1 Alike It or Not

What: To show what a set is.

Why: Placing 'alike' objects together, or creating sets, leads to the knowledge of *how many*.

How: The child decides if an object belongs to a set by discovering how the objects are alike and determining what makes them belong.

Game 1A

Get Ready – *Collect a few different kinds of objects (e.g., assorted fruit, small toys, eating utensils).*

1. Arrange as a group 5 objects in which 4 of the objects are of the same kind (e.g., all fruits) and 1 of the objects is of a different kind (e.g., a toy car).
2. Ask your child to tell you which object does not belong in the group and why.
3. Ask your child what makes the objects in the group belong to the group.
4. Repeat steps (1) – (3) with different arrangements of objects.

Stage 2: Numeration *Steps 11 thru 14*

How *ten* becomes *10* is a milestone in the learning of math. The numeration of our system of numbers as a decimal system is done with the aid of an *abacus*. The use of this *c3pla Tool* to model ideas addresses the visual and tactile ways in which children learn. This educational toy facilitates the teaching of place value which follows naturally from the placing of the beads on the abacus.

Ten becomes *10* when *ten red beads* are exchanged for *one blue bead*. By actually exchanging *ten one-beads* for *one ten-bead* and creating a place for it on the abacus, the student experiences the concept of *place value*, the idea that the *value of each digit of a numeral* depends *upon where it is in the numeral*.

Skip Counting is included in Stage 2 because it is a form of enumeration. By skip counting by 2 starting at 7, a child sees that *9 is 2 more than 7*, and that *10 is 3 more than 7* if skip counting by 3. The skill of skip counting is important not only when *adding and subtracting* but also when *multiplying and dividing*.

With numeration and skip counting in place, the stage is set for the topic of Stage 3, operations with numbers.

Step 11 I'll Trade You

What: Exchange objects in groups of *ten*.

Why: Set the stage for the idea of writing ten as *10*.

How: The child takes a walk, counts *ten steps* and then exchanges that group of ten for a marker that equals *ten steps*.

Game 11A

Get Ready – *You will need poker chips of two different colors (e.g., ten red, two or three blue). You will also need three sandwich bags, two to hold each type of chip and the third bag to hold the running count.*

1. Walk across a room in your house.
2. Tell child you will be *counting the number of steps*. Hand him/her the *ten red chips* and the empty bag.

3. Tell the child that after each step s/he will *say the number,* take a *red chip* and place it in the empty bag and to stop when s/he runs out of chips. *Start walking.*
4. Stop when child has used *up all the red chips*. Tell the child that the *ten red chips* in the counting bag can be *exchanged for one blue chip*.
5. Exchange 10 red for 1 Blue and say *"ten."*
6. *Resume walk and count* for 1 or 2 more exchanges, with the child taking a more active role in further exchanges.

Stage 3: Operations *Steps 15 thru 20*

Stage 3 introduces children to operations. If numbers are the materials of math, operations are the tools that utilize those materials.

Immersing the learner in familiar and relevant activities reduces the apprehension or uneasiness that is felt when doing something for the first time.

Operations are defined in the context of objects and actions with which children are very familiar. Addition is simulated by gluing together two strips of graph paper. Subtraction is modeled by cutting strips of graph paper with scissors. Multiplication and division are taught using the graph paper strips as well as a grid/matrix and comparing to copying/duplicating. Lastly, division is demonstrated by folding a strip of graph paper. This experiential approach to learning makes the process playful, imaginative, and motivating. Students gain knowledge and acquire skills, and, at the same time, have fun.

Learning math by engaging in meaningful and relevant activities strips away its abstract nature. With this approach children experience math in the context of their everyday life.