3 Steps to Doing Math at Home with Students with Complex Communication Needs, Sensory Impairments, and Physical Impairments

Questions? Request technical assistance from Alt+Shift.

Step 1: Gather tools

Use what is familiar to your learner - As much as you can, use the same assistive technology, equipment, accommodations, and instructional materials that are normally used with your learner.

Work with your learner's teacher and ancillary staff (such as therapists, consultants, and counselors) - Find out what types of tools are used at school and how they can be acquired or recreated at home.

Use household items - See chart below for ideas for math and communication tools that may already be in your house.

Step 2: Choose a math activity.

Look to your school or resource lists for ideas - Activities may come from your school, or you may find activities using any number of resource lists.

Work with your learner's teacher - Ask your learner's teacher about skills or activities that would be most useful for your learner.

Start small - Math time may last anywhere between 5 and 60 minutes. Start with a short activity, and build up from there.

Choose content that will be engaging for your learner and familiar to you - Consider content that is interesting to you and your learner, but also familiar to you. The more comfortable you feel with the math, the better the activity is going to go.

Consider using every day activities - Think about when you use math in your everyday life. Could you engage in those everyday activities with your learner, highlight mathematical thinking as it happens, and invite your learner to help you do that math?

Consider addressing topics that are "big ideas" in mathematics - The Delta Math Readiness Standards include the Common Core State Standards that are most helpful to master in every grade in order to be ready to learn at the next grade. This may provide some ideas for topics to work on with your learner.

Step 3: Walk through the activity with your learner.

Use the tools and activity materials - Gather the necessary materials. Set them out at your work space. Use any communication tools, assistive technology, accommodations, and other equipment that your learner requires.

Lower expectations for yourself and your learner for the first sessions - Give yourselves permission to go slow and make mistakes. In addition to the parent-as-teacher/learner dynamic, you may also be dealing with new tools, content, and work environments.

Approach the activity like you are helping your learner with homework - Read through the information, do your best to clarify what your learner is supposed to do, encourage independent work, be ready to exchange ideas with your learner as he/she (and possibly also you) work through the math and make sense of it.

Keep in mind basic tips for a successful activity - Here are just a few tips that might help your math time be successful:

- Be patient with yourself and your learner. Everyone tries activities that do not go well, including educators.
- Provide opportunities for your student to engage with you, but don't force it. If your student does not engage, every minute or so, calmly invite him/her to join you. If you are doing the activity with more than one learner, continue with the others even as you continue to invite the disengaged learner to join in. Some days, simply making several invitations may be how you spend the math time.
- Provide choice. For example:
    - provide two problems and let your learner select the one to work on
    - provide a few activities and let your learner choose the one to do
    - let the learner choose the color of the pen or the types of countable objects
    - use a choice board
    - let the learner choose when to do math time
- Stick to about 1 to 5 problems per session
- Use "repetition with variety" which means repeating the math concept, but in different ways. For example:
    - count collections of items, but use different items each time
    - alternate who makes up the problem (you write a problem, then the learner does, then another person in the house)
    - change your location (do a problem in the kitchen, then move to the living room)
    - do each problem on a different size or color of paper or with a different color pen

- change the numbers or shapes in the problem
- change the modality - draw instead of write, clap instead of point

Math and Communication Tools in the Home

*Even if you do not have all of the tools and equipment that are in classrooms, some homes may already have items that can be used for math activities.

Household item	Purpose
Collections of items for working with numbers Examples: ● buttons ● paper clips ● small toys ● balls ● blocks ● checkers ● M&Ms, goldfish crackers, dry pasta, etc.	Use the items to help your student see what is happening when doing math problems such as ● Counting collections ● Creating collections of a certain amount ● Adding, subtracting, multiplying, and dividing ● Arranging items to show growing amounts in patterns
Small containers for sorting and bundling counted items Examples: ● cups ● bowls ● buckets ● straws or sticks ● rubber bands ● resealable bags ● ice cube trays or egg cartons ● clean, empty food containers ● string (formed in a circle to show an area where counted things can go) ● paper and pens for drawing areas where counted things can go	Keeping track of what has been counted, and seeing amounts in different ways, are important for the development of number sense, and also helps with counting accuracy.
Homemade math communication boards Use a piece of paper and a pen to draw a number line. Number line example	The learner can use the number line to solve problems and also to communicate by touching the numbers on it to answer questions. Consider adding words related to the lesson

Number line pdf	like “add” or “equals” so the learner can touch those numbers to say them as well. Talk to your learner as you normally would, but when you say one of the words represented on the number line, point at it. Respond to words your student says by using the number line as well. This is called “modeling.” Two videos are provided to get you started. One is a short example of a teacher and student using a communication board (not math though). The other is a more detailed description of the approach. Example of using a simple paper communication board S’MoRRES (YouTube)
Homemade communication cards Use small pieces of paper, or notecards. Write one word on each. If possible, include a picture with it.	Although learners should have access to all of the words all of the time, as you work toward that, having individual words for students to point to can be helpful. For example, you can ask “How many chairs are at the table?” The learner is presented with two cards, one with the correct amount, one with a different amount. The learner looks at, grabs, points to, etc. one of the answers. Another example: “Are these shapes similar or congruent?” The adult presents the two options and the student selects or indicates toward one of them.
Printer and paper Core vocabulary communication boards can be printed and used right away.	Core vocabulary words represent a subset of the words we use most frequently and in various ways. Use these communication boards just like the homemade math boards described above. Here are two printable communication boards (meant to be printed two-sided on one piece of paper):

	• Proloquo2Go Core Board • Universal Core Board with numerals and letters Here is a video of using the Universal Core board to model language while reading a children's book about math. • Pete the Cat with Core word modeling
Cardboard and scissors for shapes Cut out various shapes or sets of shapes.	Learners can use the shapes to identify, sort, and talk about properties of the shapes.
Rulers or straight edge tools	Help students draw straight lines for more accurate number lines and shapes.
Paper and pens or markers to rewrite problems	Large, dark writing is easier to see. Having plenty of empty space can help students solve problems. When problems are too small or close to each other, working directly on the paper can be difficult. You can save paper if you have dry erase markers and sheet protectors. Put one piece of paper in the sheet protector and use it as a white board. If you are feeling brave, dry erase marker can also be used on most windows (trial it first!)
Calculators Examples: • cell phone • tablet (larger print than cell phone) • a large key calculator from the dollar store • a graphing calculator	Allows learners to be faster with calculations after they understand the concept of what they are doing. For example, once a learner knows what addition is and when to use it, being able to add using a calculator allows him/her to apply addition without losing track of the larger math problem.