

**PATHWAYS for NeuroEducational Development
DIGIT SPANS (VISUAL AND AUDITORY PROCESSING)**

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GENERAL RULES TO FOLLOW:

- Refer to your developmental profile to determine at what level your child is functioning. If your child has not been evaluated but it has been suggested to try this activity you will need to determine at what level of sequencing your child is most efficient. To do this, simply follow the directions provided below. To be considered strong the child must be getting 80% of that particular sequence of numbers correct on the first try. For example if your child appears to be strongest with number sequences of four then this is where you want to begin to ensure that your child is experiencing much success with this activity. You will slowly add in higher sequences of numbers as the child's ability improves.
- For example: If it has been determined that your child is most successful with sequences of four numbers such as (9...3...0...7), getting 80% of them correct on the first try, this is where the emphasis will be placed during each session. However you will have the child try several sequences of five numbers such as (7...1...5...2...8). This provides a challenge and assists in moving him onto the next higher level of sequencing. As he is able to get more of the five number sequences correct on the first try place more emphasis on these, decreasing the four number sequences and increasing the five number sequences. Eventually your child will be doing only five sequences and getting 80% of them correct on the first try; now you drop the sequences of four numbers completely and provide the child with sequences of five numbers adding in the occasional sequence of six numbers (7...4...0...9...2...8) during each session. As the child becomes more successful with the six number sequences, getting them correct on the first try, you will be incorporating more sequences of six numbers and less of fives. Over time the child will be successful on the first try 80% of the time with the sequences of six numbers and will require very few sequences of five numbers. Now is the time to drop the five number sequences and move onto sequences of six with the occasional seven thrown in. And so the process continues as you improve on auditory and visual sequencing.
- To begin you will need to make at least 40 cards of each of the number sequences you will be working with. For example 40 different sequences of four numbers, 40 different sequences of five numbers etc. Remember that your child may have an off day and occasionally process at a lower level so have some cards with a lower sequence handy for these times. You may use recipe cards and write on the blank side. Use a black felt marker. The numerals should be neat and between ½ to 1 inch tall unless otherwise stated by the Neurodevelopmentalist.
- For sequences of seven or less numbers do not use a numeral more than once on the card. For example you would **NOT** want 4...9...4...7...2...8. There is a repetition of the number four which is not appropriate. Once the sequence of numbers are higher than seven the repetition of numbers is allowed as long as they do not run consecutively such as 9...4...2...2...6...4...8...3...5.
- It is important to add 20 new cards to your pile every week. A child or an adult, who sees the same cards day after day, even if there are many in the pile, will soon become familiar with bits and pieces of some of the sequences. This greatly diminishes the intensity of the program activity and can delay improvement in this area.
- It is important to provide a **random mix** of numbers on each card to properly challenge the child. For instance you would not want a sequence to read 1... 2... 3... 6... 9. The child will easily remember 1, 2, 3 as they are consecutive numbers. A sequence of 4... 7... 9... 5 which is random and correct, requires a greater effort to remember thus poses a greater challenge.

- It is important to keep this activity positive and fun. Do not become discouraged if your child is not able to do a sequence. If he misses the sequence you might say, “Almost, try again” but be **POSITIVE AND ENCOURAGING**.
- You give the child three chances to get each number sequence correct. It is vitally important that the child get it right on the third try. If the child misses it the first time you might say, “Almost, try again.” You then repeat the process in exactly the same way. If the child does not get it on the second try be positive, you may say something like, “So close.” Now the child needs to get it correct on the third try. You may consider the following techniques to assist in achieving the correct answer on the third try:

For auditory digit spans say the numbers faster on the third try. This makes it much easier for the child to remember the sequence. Or you can say each number individually and have the child repeat the number right after you. For visual digit spans you may allow the child to look at the number while he repeats it back to you or show the card longer than the three seconds.

- Your child’s visual and auditory digit spans may fluctuate from day to day or from session to session. If your child is sick, tired, excited, or distracted it may temporarily drop. It is important that your child not feel discouraged if this does occur. Simply drop down to a number sequence where your child can experience the 80% success rate. If his ability drops and stays down for two weeks contact our office for further instruction.

Remember the child needs to be getting 80% of them correct on the first try.

- It is important that this be a **FUN** activity for the person on program thus a reinforcement or reward system will likely be put into place. A staff member will explain this to you as there are many variations. Increasing digit spans is often slow work thus keeping it positive by adding reinforcement may speed the process along. An increase of one digit span is equivalent to one developmental year and has an exponential effect as it can result in improvement in a number of areas: socially, behaviourally, academically as well as in time management, organization, understanding consequences, cognitive ability, reading, spelling, etc. Therefore, it is important to give this program activity much attention.

ADDITIONAL RULES TO FOLLOW:

- When the child is repeating the digit span back to you he **SHOULD NOT** be clumping them together. For example consider the sequence 9... 4... 7... 3... 8. Clumping occurs when the child repeats it by saying “nine four seven” pausing and then “three eight.” The child should also **NOT** repeat the number back by saying nine hundred forty-seven and thirty-eight. The sequence should be repeated back as 9... 4... 7... 3... 8, each a distinct number.
- Please check the material you are using for the digit spans. If you can see the numbers through the back of the card, the child may inadvertently be doing the same when repeating them to you. If the cards are see-through you will have to cover the back of the card with your hand.
- Visual and Auditory digit spans are most often written on program 2-4 sessions a day for 3-5 minutes each time. If your session is 3 minutes long spend 1 ½ minutes doing visual digit spans and the remaining 1 ½ minutes on the auditory digit spans.
- When the child is repeating back the auditory digit spans it is important that he is not visualizing (picturing or seeing the numbers) in his head. Watch the eyes, if the eyes go up and to the side so that it appears he is looking at something out of the corner of his eye, he is most likely picturing them in his head. If he closes his eyes while listening to the sequence and or repeating it back to you, he may also be visualizing. You can also ask the child if he is seeing the numbers in his head. If yes, then

simple ask him not to do this. If he can not stop picturing them you can contact the office for further direction. While this is a good copying technique it is not allowed while either testing to determine the level of auditory sequencing or when doing the auditory digit spans as a program activity. Visualizing the numbers greatly diminishes the effectiveness of this program activity.

VISUAL DIGIT SPANS

- Show the card to the child for three seconds. The child should not begin reciting the sequence back to you until you have turned the card away from him. Remember to cover the back if necessary.
- After three seconds turn the card away and the child is to repeat the number sequence back to you in the correct order.
- Regardless of the length of the sequence the card is always shown for three seconds.

AUDITORY DIGIT SPANS

- Say the number sequence to the child with a one-second interval between each number. **The child is not to see the number sequence only hear it.** If the cards are see through it may be necessary to cover the back of the card with your hand.
- When saying the number sequence to the child it is important to use a monotone voice. This does not have to be a boring voice but do not use a “sing song” voice as this activates a different part of the brain than what we are intending to target.
- The child is to wait until you give him the entire sequence and he then repeats it back to you. The child does not have to repeat the number back with the one second interval between numbers.

If you are experiencing difficulty with this activity please do not hesitate to contact our office for further clarification. There are a number of variations to this activity which can be used depending on varying circumstances; your child may require some minor alterations to allow success.

EXAMPLES OF DIGIT SPAN CARDS

5 9 0 3 8	4 9 3 0 5 8	2 5 9 0 4 1 7
Directly above is a 5 number sequence	Directly above is a 6 number sequence	Directly above is a 7 number sequence