In order for long-term memory to function properly, there has to be the ability to efficiently and adequately perform these 3 functions.

Encoding - this involves changing stimuli into a useable form so the information can be transferred into storage. This is just like a computer where information punched into the keyboard is transformed into an electronic code that the computer can store.

In a person with Auditory Processing Disorder/APD, the information encoded may be incomplete or incorrect due to not having been processed correctly or only part of it being processed/understood.

Storage - this is the retention of information in our long-term memory (LTM) which can later be retrieved. We store information in different areas of the brain whereas computers store information on disks. Also, the storage of our LTM is limitless however, computers have a finite capacity.

In a person with APD, because of distraction during the storage process, due to delayed processing from the brain focusing on processing/understanding information before saving it - especially if it is incorrect or incomplete and makes no sense - this may lead to information not being stored properly or only part of it being stored, or all of it being rejected as nonsense because it makes no sense, and not stored at all.

Retrieval - this is the process of recovering information from LTM. We retrieve information via cues or prompts, which is similar to how computers retrieve information.

If information has not been encoded or stored properly, when retrieved it will make little or no sense due to being incorrect or incomplete.

*The person with APD will NOT KNOW that what they have processed, stored and remembered is incorrect or incomplete.

In a person without APD or other condition affecting memory, Hermann Ebbinghaus (a German psychologist) found that after an hour, without any attempt being made to retain it, approximately 50% of information is forgotten. The rate of forgetting then seems to level out and by the 31st day after learning, 28% of the information is retained. However, if the information holds meaning for the learner or is complex, the rate of forgetting is not as great. It is therefore important to use methods to retain new information, especially if the learner has APD or other difficulties affecting memory.

For information to be transferred from Short-term memory to Long-term Memory, it needs to be attended to and actively rehearsed. There are different ways to rehearse information. One is maintenance rehearsal which involves repetition of information in order to keep the material active in short-term memory. The person rehearses or repeats the information without concentrating on its meaning, therefore attending to the material at only a superficial level of processing.

A second type of rehearsal is elaborative rehearsal. This involves associating new information with already existing information stored in Long-term Memory for easier recall – e.g. the methods below.
A FEW SUGGESTED STRATEGIES TO HELP STORE INFORMATION IN THE LONG-TERM MEMORY

Multi-sensory methods work best - employing sight, touch, smell, sound. Where the auditory modality is weakened by poor auditory processing, other senses will work better, but practising with auditory methods can help to strengthen auditory memory.

1. Method of loci - an ancient memory aid which involves choosing a location you know extremely well, such as your home. You then take a mental walk through the location to choose various resting points along the way, e.g. the stove and the stereo. You then associate a segment of information to be remembered with a resting point. To recall the information, you take a mental walk through the various locations where each location or resting point acts as a retrieval cue.

2. Acrostics - phrases, rhymes or poems in which the first letter of each word is a cue to retrieve another word which begins with the same letter. For example, an acrostic to remember the planets in their correct order is (M)y (V)ery (E)vil (M)other (J)ust (S)liced (U)p (N)ine (P)eople (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto).

3. Acronyms - words formed out of the first letters of a series of words. For example, NASA is an acronym for (N)ational (A)eronautics and (S)pace (A)dministration.

4. Peg word method - also uses imagery or visualisation to recall information. Information to be remembered is hung on mental 'pegs'. They are:
   - One is a bun
   - Two is a shoe
   - Three is a tree
   - Four is a door
   - Five is a hive
   - Six is sticks
   - Seven is heaven
   - Eight is a gate
   - Nine is a line
   - Ten is a hen

You then associate the items to be remembered with the pegs. For example, if you needed to remember the words cat, cup and fish you might imagine a cat eating a bun, a shoe sitting in a cup and a fish hanging from a branch of a tree.

5. Narrative chaining - another useful way to remember information such as a list of words. A story is created around the words to be remembered, linking the words in a specific order. For example, if you needed to remember the following list:
   - cat, baby, chair, book, fire, clock, cupboard, bed

You might create a story like this.
There was a cat and a baby sitting on a chair reading a book in front of the fire. The clock on the cupboard said time for bed.

Now try to construct a story out of the list of words below:

- tree, car, gate, bike, hose, bird, road, flower

6. **Rhymes** - a verbal mnemonic that helps us remember information. You probably use rhymes all the time without realising. At the end of a month, many people can be heard humming the rhyme 'Thirty days hath September, April, June and November' in order to work out how many days in that month. It would be difficult to remember the length of each month without such a rhyme. Rhymes are old and useful tricks to remember information more effectively.

   Other strategies can be employed as well, to suit your child's preferred learning style and interests. Be imaginative, use colour and add images.