



Guidelines for Speech-Therapy Work with Children who have Special Educational Needs: A Learner-Centred, Play-Based Approach

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Abstract

This handbook provides a systematic exposition of an original methodological framework for speech-therapy work with children who have special educational needs (SEN). The methodology is founded on the principles of a learner-centred approach, play-based speech therapy, the creation of an emotionally safe environment, and a close partnership with the family and educators. The handbook offers a complete system, from diagnostics and SMART goal setting to specific play-based techniques and progress monitoring models. Special attention is given to adapting exercises for children with developmental delays (DD), autism spectrum disorders (ASD), and childhood apraxia of speech (CAS). The methodology aims to foster sustained motivation for speech activities and to generalize acquired skills into the child's daily life. This handbook is intended for practicing speech-language pathologists, special education teachers, psychologists, educators, and students in related fields.

INTRODUCTION

Speech and language disorders are among the most common developmental challenges in childhood. According to data from the U.S. National Institute on Deafness and Other Communication Disorders, approximately 7.2% of American children aged 3-17 have experienced a voice, speech, or language disorder within the past year [1]. The issue becomes particularly acute in the context of working with children who have special educational needs (SEN). Global reports from UNICEF and the World Health Organization (WHO) indicate that there are around 240 million children with disabilities worldwide, which constitutes roughly 1 in 10 children [2]. In 2019, approximately 317 million children and adolescents had health conditions that contribute to developmental disorders [3]. A significant portion of these children face communication difficulties, leading to stigmatization, social isolation, and barriers to receiving quality education and healthcare [4].

In this context, the role of the speech-language pathologist (SLP) is undergoing a significant transformation. The specialist is no longer merely a corrective educator focused on sound production but becomes a key integrator within the interdisciplinary team supporting the child [5]. A modern SLP is an "architect of the communicative environment" who not only works directly with the child but also coordinates the efforts of parents, teachers, and other specialists (psychologists, special educators, rehabilitation therapists). Their task is to provide comprehensive psycho-educational support, develop individualized programs, and ensure the transfer and reinforcement of acquired skills in the child's

natural environment—at home and in educational settings [5]. This systemic approach, based on close collaboration with all participants in the educational process, is the cornerstone of the methodology presented in this handbook and reflects the author's position [6].

The main goal of this handbook is to systematize and provide a scientific basis for the author's principles of speech-language therapy for children with SEN, grounded in many years of practical experience.⁸ The handbook aims to offer practicing specialists, students, and parents a reproducible and adaptable workflow that allows for the creation of an effective and humane intervention trajectory for each child. The objective of this guide is to move from a collection of disparate exercises to a holistic, philosophically and methodologically sound system where every element—from diagnostics to monitoring—is subordinated to the overall goal: the development of a harmonious personality who is capable and willing to communicate.

The handbook consists of five chapters that sequentially unveil all stages of work within the proposed methodology.

- Chapter 1. Theoretical and Methodological Principles lays the foundation of the approach, detailing four key principles: a learner-centred focus, play-based speech therapy, the creation of emotional safety, and partnership with the family and school.
- Chapter 2. Diagnostics and Individual Planning offers practical tools for the initial assessment of the child's condition and the setting of specific, measurable goals for intervention.

- Chapter 3. Play Techniques: The “ACTION → SOUND → WORD” Model describes the core of the methodology—specific play-based techniques and session scripts adapted for children with various types of disorders.
- Chapter 4. The “Family-School” Support System presents a model for organizing interaction between the SLP, parents, and educators to ensure the continuity and effectiveness of the therapeutic process.
- Chapter 5. Progress Monitoring and Plan Adjustment completes the cycle, offering simple and effective ways to track dynamics, manage expectations, and maintain the resilience of all participants in the therapeutic process.

CHAPTER 1. THEORETICAL AND METHODOLOGICAL PRINCIPLES

The proposed methodology is based on four interconnected principles that form a unified ecosystem of support for the child. This is not merely a set of tactical techniques but a holistic philosophy that defines all aspects of the SLP’s work. A learner-centred focus and the creation of emotional safety establish the conditions in which play-based therapy becomes maximally effective. Partnership with the family and educators ensures the transfer and scaling of the results achieved in these conditions into the child’s real life. This approach marks a transition from the traditional “defect treatment” model to a modern “developmental environment creation” model.

Learner-Centred Focus: Recognizing Each Child’s Psycho-emotional Profile

The first and foundational principle of the methodology is the focus on the child’s personality and the consideration of their unique psycho-emotional characteristics. This approach resonates with the ideas of humanistic psychology, particularly Carl Rogers’s client-centered therapy, which posits unconditional positive regard, empathy, and therapist congruence as key conditions for personal growth [7]. In the context of speech therapy, this means rejecting standardized, “one-size-fits-all” technologies in favor of finding an individual approach for each child, taking into account their character, temperament, and information processing threshold.

Research confirms that child-centered approaches demonstrate high efficacy. For instance, a meta-analysis of 52 studies on Child-Centered Play Therapy (CCPT) showed that it leads to significant improvements in areas such as reducing problem behaviors and increasing self-efficacy [7]. Other studies also confirm that CCPT promotes the development of receptive and expressive language, improves social interactions, and enhances self-regulation [8, 9].

Key elements of this approach in practice include:

- Following the Child’s Lead: The therapist does not impose their program but integrates therapeutic tasks into the activity the child chooses.
- Unconditional Acceptance: The SLP creates an

atmosphere where the child is not afraid to make mistakes and feels accepted regardless of their speech successes.

- Focus on Strengths: Instead of concentrating solely on deficits, the therapist builds upon the child’s strengths and interests, using them as a resource for development.

Play-Based Speech Therapy: Frequent Activity Switches and “Invisible” Learning Through Toys

The second principle is the use of play as the leading method of intervention. For a child, play is not entertainment but their primary “work,” through which they learn about the world, master social roles, and develop key skills [7]. A play-based format for sessions makes the learning process engaging, maintains high motivation, and sustains the child’s voluntary attention for extended periods. Frequent changes in play activities and the use of bright, interesting toys help to avoid fatigue and satiation [10].

The effectiveness of play-based interventions for children with SEN, especially those with autism spectrum disorder (ASD), has been confirmed by numerous studies. A systematic review of 32 randomized controlled trials showed that play-based interventions contribute to improvements in social interaction, communication, play behavior, and a reduction in behavioral problems in children with ASD [11]. Another meta-analysis also found that play-based approaches have a positive impact on the mental health of children with ASD, particularly their emotional functioning [12]. Play stimulates the development of four key domains necessary for social development: socio-cognitive, emotional, regulatory, and neurocognitive, including speech skills [11].

Emotional Safety: Building Trust and a Low-Stress Environment

Creating a comfortable and trusting atmosphere during sessions is the third integral principle of the methodology. This aspect is closely related to the concept of the “therapeutic alliance”—a collaborative, cooperative relationship between the therapist, the client, and their family [6]. Research shows that the quality of this alliance is one of the strongest predictors of positive therapeutic outcomes, sometimes even more significant than the specific techniques used [6].

Building a therapeutic alliance with a child with SEN and their family involves three groups of factors [13]:

- Foundational Factors: Elements necessary for establishing initial contact and trust. These include empathy, honesty, respect, and demonstrating genuine interest in the child and their family.
- Structural Factors: Actions that help the therapist understand the unique experiences of the family and child. This includes active listening, validating their experiences, and collaborative goal-setting.
- Protective Factors: Elements that provide a sense of safety and support throughout the therapeutic process.

This includes predictability, consistency, and the therapist's readiness to adapt their actions in response to the child's changing needs.

In a low-stress, emotionally safe environment, a child is more willing to engage, is not afraid to experiment with speech, and shows initiative, which is a necessary condition for successful intervention.

Partnership with Family and Teachers: Systematic Skill Reinforcement Outside the Therapy Room

The fourth principle underscores the critical importance of extending the intervention work beyond the speech therapy room. Acquired skills must be constantly used and reinforced in daily life; otherwise, they remain non-functional. To achieve this, it is necessary to build a partnership system in which parents and educators become active participants in the therapeutic process.

Table 1. Comparative Analysis of Traditional vs. Learner-Centred Play-Based Approaches in Speech Therapy

Source: Compiled by the author based on scientific literature [7, 10, 14, 17].

Parameter	Traditional Directive Approach	Learner-Centred Play-Based Approach
Therapist's Role	Instructor, expert who "fixes" a defect.	Partner, facilitator who creates conditions for development.
Child's Role	Passive follower of instructions.	Active participant, initiator of activity.
Primary Method	Drills, mechanical training.	Play, meaningful and motivated activity.
Focus of Intervention	Correction of an isolated speech defect.	Holistic development of the child's personality through communication.
Source of Motivation	External (praise, grades, rewards).	Internal (interest in the game, desire to achieve a goal in the game).
Work with Family	Informing about results, giving homework.	Coaching, teaching parents strategies, joint planning.
Attitude to Errors	An error is a failure to be corrected.	An error is a natural part of the learning process, a reason to find a new solution.

CHAPTER 2. DIAGNOSTICS AND INDIVIDUAL PLANNING

The diagnostic stage within this methodology aims not simply to state the presence and nature of a speech disorder, but to conduct a functional analysis that will allow for the design of an individual therapeutic environment. The diagnosis answers not so much the question "What is wrong with the child?" as "What conditions does this specific child need to learn successfully?" This approach shifts the focus from deficits to finding resources and optimal ways of interaction.

To illustrate the practical application of this methodology, we will introduce a running case study. Alex is a 5-year-old boy diagnosed with Autism Spectrum Disorder (ASD) and a moderate expressive language delay. He communicates mainly through single words and gestures, has difficulty with social reciprocity, and shows significant sensory sensitivities, particularly to loud noises and certain textures. Throughout the following chapters, we will see how each step of the process is tailored to Alex's unique profile.

Research unequivocally indicates that collaboration between parents and SLPs leads to more optimal outcomes for children [14]. Parent-implemented interventions, guided by a specialist, show a positive impact on children's language outcomes [14]. Similarly, a strong partnership between family and school correlates with improved academic performance, social skills, motivation, and the overall well-being of students, including those with SEN [15, 16].

Such a partnership involves a shift from a model where parents and educators are passive recipients of recommendations to a model where they act as competent allies. The SLP teaches them simple and effective techniques that can be integrated into daily routines (meals, play, walks), "prompting" the child to use new speech skills. This provides the necessary frequency of repetition for the automatization of sounds and structures and helps generalize skills in the natural communicative environment.

Initial Observation Checklist (Temperament, Sensory Triggers, Attention Span)

For the initial assessment, a structured observation checklist is used, which the SLP fills out during the first few meetings with the child, as well as based on conversations with parents. This tool is not intended to make a diagnosis (e.g., of sensory processing disorder), but it provides invaluable information for planning sessions. It helps to understand which stimuli are resourceful for the child and which are stressful, and how to structure a session to minimize discomfort and maximize engagement.

The checklist (see Table 2) includes an assessment of the child's reactions to various sensory modalities, as well as observations of their behavioral and emotional characteristics. For Alex, this checklist revealed high auditory hypersensitivity (he covers his ears when a blender is turned on at home) and tactile hyposensitivity (he constantly seeks deep pressure by crashing into sofas and asking for tight hugs). This immediately informs the therapist that sessions should be held in a quiet room and that deep pressure activities can be used as a regulatory tool.

Table 2. Initial Observation Checklist (Temperament, Sensory Triggers, Attention Span)

Source: Compiled by the author based on [18–20].

Sensory System / Behavior	Hypersensitivity (Avoids Stimuli)	Hyposensitivity (Seeks Stimuli)	Notes / Behavioral Examples
Tactile	– Avoids touch, messy play (sand, glue). – Reacts negatively to clothing tags, certain fabrics. – Resists hair washing, nail cutting.	– Constantly touches objects and people. – Loves tight hugs, pressure. – Doesn't notice being dirty or minor injuries.	<i>e.g., "Cries if glue gets on hands," "Constantly fiddles with a soft toy."</i>
Auditory	– Fears loud, sudden noises (vacuum, drill). – Covers ears in noisy places. – Distracted by quiet background sounds.	– Loves loud music, noisy games. – Makes many loud sounds themselves. – Doesn't always respond to their name.	<i>e.g., "Covers ears in the music room," "Loves to bang toys on the table."</i>
Vestibular (Movement & Balance)	– Afraid of swings, slides, unstable surfaces. – Moves very cautiously, avoids jumping, running. – Gets motion sickness.	– Loves to spin, rock, jump. – Constantly in motion, can't sit still. – Rocks on their chair.	<i>e.g., "Refuses to go near the swings on the playground," "Spins in place until they fall."</i>
Visual	– Irritated by bright lights. – Easily distracted by visual stimuli in the room. – Avoids eye contact.	– Loves to look at bright, flashing lights. – Stares intently at small details of objects.	<i>e.g., "Squints in bright sunlight," "Can watch a car's spinning wheels for a long time."</i>
Attention & Behavior	– Tires quickly, becomes exhausted. – Has difficulty switching from one activity to another. – Shows anxiety, tearfulness in new situations.	– Very short attention span, constantly jumps from one thing to another. – Shows impulsivity, disinhibition.	<i>e.g., "Gets fussy after 5 minutes of play," "Grabs all the toys one after another."</i>

Priority Zones for Intervention: Articulation, Phonemic Awareness, Sound Production

Based on a comprehensive speech and language assessment, three key, interconnected zones are identified for primary intervention:

1. **Developing Mobility of the Articulatory Organs:** Working on the precision, strength, and differentiation of movements of the lips, tongue, and lower jaw. This is the foundation for the correct placement for sound production [21].
2. **Developing Phonemic Awareness:** Fostering the ability to distinguish and identify speech sounds (phonemes) by ear. This skill is the foundation for mastering sound-letter analysis and, consequently, reading and writing [22]. Research shows that children with sound production disorders are at risk for developing dyslexia, so work on phonological awareness is preventative [22].
3. **Eliciting and Automating Sound Production:** Direct work on eliciting, establishing, and integrating absent or distorted sounds into speech.

The choice of specific sounds for intervention is determined not only by the classic principle of ontogenetic sequence (from earlier to later developing sounds) but also by several other

factors: the sound's impact on overall speech intelligibility, its stimulability (the child's readiness to produce it), and its significance to the child and their family [23, 24].

SMART Goal Map for One Month: Sample Table

After identifying priority intervention zones, it is necessary to translate them into specific, measurable, and achievable goals. The SMART methodology is used for this purpose, which helps to structure the work plan and make it understandable for all participants, including parents [25]. Each goal should be:

- **S (Specific):** Clearly define which skill is being developed (e.g., "produce the [th] sound," not "improve speech").
- **M (Measurable):** Contain quantitative indicators to track progress (e.g., "in 8 out of 10 attempts," "with 80% accuracy").
- **A (Achievable):** Be realistic for the child at their current stage of development.
- **R (Relevant):** Correspond to their current needs and be significant for improving communication.
- **T (Time-bound):** Have a clear deadline for achievement (e.g., "by the end of the month," "over three consecutive sessions").

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Planning is carried out by decomposition: a long-term goal is set for a specific period (e.g., 1 month), which is then broken down into smaller, short-term goals for each week. This allows for progress towards the main goal in small but

confident steps, which is especially important for maintaining the child's motivation and managing parents' expectations [26]. Table 3 shows a sample goal map adapted for our case study, Alex.

Table 3. Sample SMART Goal Map for a 4-Week Intervention Period (for a 5-year-old child with DD and mild dysarthria)

Source: Compiled by the author based on the SMART methodology and speech therapy goal banks [27–29].

Period	Goal	Success Criterion
Long-Term Goal (1 month)	By the end of the month, Alex will combine two words (e.g., “want car,” “more juice”) to make requests during structured play tasks.	Spontaneously produces a 2-word request 5 times per session over two consecutive sessions.
Week 1	Alex will point to a desired object and say its name (one word).	Responds correctly in 8 out of 10 opportunities with a verbal prompt (“What do you want?”).
Week 2	Alex will use the word “want” with a gesture (pointing) to make a request.	Uses “want” in 5 out of 10 opportunities, even if the second word is not present.
Week 3	Alex will combine “want” + [noun] with a model from the SLP (“Say: ‘want ball’”).	Imitates the 2-word phrase correctly in 6 out of 10 trials.
Week 4	Alex will spontaneously say “want” + [noun] in a play scenario (e.g., choosing a toy from a box).	Produces the 2-word phrase spontaneously at least 3 times during the session.

CHAPTER 3. PLAY TECHNIQUES: THE “ACTION → SOUND → WORD” MODEL

The central practical idea of the methodology is the “ACTION → SOUND → WORD” model. It inverts the traditional speech therapy sequence (“first learn the sound in isolation, then in syllables, then in words”). In the proposed model, the primary element is the child's meaningful, motivated action in a game. This action creates a natural need for a sound (a sound effect, an exclamation) that accompanies it. Only then is the sound organically integrated into the word that denotes it. This path is neurophysiologically more natural and motivationally justified for the child than the abstract drilling of isolated speech elements.

Articulation Drills via Bright Objects and Micro-Story Settings

Even routine and sometimes boring articulation exercises can be turned into an exciting game. Instead of mechanical repetition by count, each movement is embedded in a small play scenario using real objects.

- **“Smile-Pucker” Exercise:** Not “stretch your lips, now pucker,” but “show me how a frog smiles, and now how an elephant drinks water with its trunk.” Corresponding toys can be used.
- **“Clock” Exercise:** The tongue moves from side to side, imitating the pendulum of a real or toy clock [30].
- **Building Airflow:** Instead of just blowing on a cotton ball, you can have a “soccer game,” blowing the cotton ball into a goal, or a “snowstorm,” blowing small pieces of napkin off your palm.
- **Eliciting Sounds Through Onomatopoeia:** The [u] sound is a train whistle, the [s] sound is the song of water

or a pump, the [z] sound is a bee buzzing [31]. Using toys (a train, a bee) makes this process visual and interesting [32].

This approach not only helps to practice the necessary motor skills but also develops imagination, emotional engagement, and, most importantly, connects the movement of the articulatory organs with a specific meaning and image.

30-Minute Lesson Script: Warm-up, Core Play Task, Speech Block, Reflection

The session structure is designed to maintain the child's optimal level of engagement and motivation. It includes a mandatory change of activities—from active to calm, from general to focused.

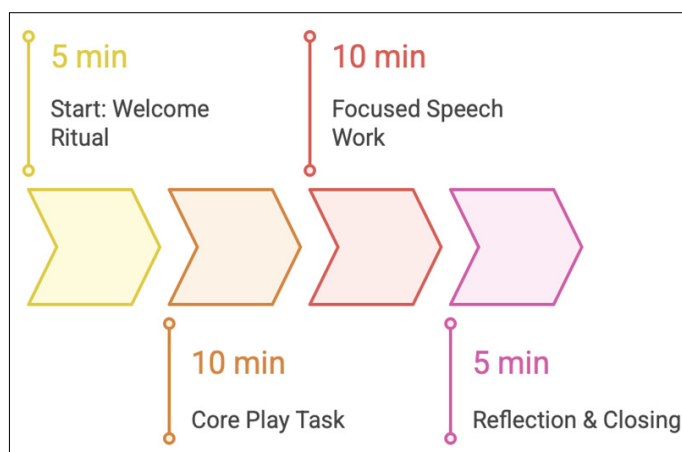


Figure 1. Structure of a 30-Minute Play-Based Session

- **Phase 1. Warm-up (5 min):** Begins with a welcoming ritual (e.g., a special song or handshake) that creates predictability and sets the mood for work. This is followed by a short sensory game (e.g., with kinetic sand or massage balls) to stabilize the emotional state.

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- Phase 2. Core Play Task (10 min): This is a gross motor, active game. The child jumps, runs, builds. The speech task is “embedded” in this activity. For example, to build a tower, you need to “drive” a block over while making the sound “da-da-da.”
- Phase 3. Speech Block (10 min): The activity shifts to a calmer, tabletop one. This could be a game with cards, lotto, or working with toys at a table. Here, the main, focused practice of the target sound or grammatical structure takes place.
- Phase 4. Reflection (5 min): The session ends with a calming activity (e.g., listening to quiet music, playing with water). A goodbye ritual is mandatory, signaling the end of the work. In the last few minutes, the SLP provides brief feedback to the parent.
- Developmental Delay (DD): For children with DD, who often have difficulties with regulation and organizing their activities, connecting speech with gross motor skills is effective. Rhythmic body movements help to organize the rhythm of speech [33, 34].
 - Example: “Fun Jumps” game. Colored circles are laid out on the floor. The child jumps from circle to circle, producing a target syllable with each jump (e.g., “ba,” “bo,” “boo”).
- Autism Spectrum Disorder (ASD): The key is to create a predictable and structured environment. Visual supports are actively used for this purpose [35, 36].
 - Example: For Alex, the SLP uses a “First-Then” visual schedule (see Figure 2). It shows him: “FIRST, we build the tower, THEN you get the bubbles.” This visual cue reduces his anxiety about transitions and increases his cooperation with the less-preferred task [36]. The therapy room is kept tidy with minimal distractions to accommodate his visual sensitivities.

Exercise Examples for Children with DD, ASD, and CAS

The approach is adapted depending on the specifics of the child’s disorder.

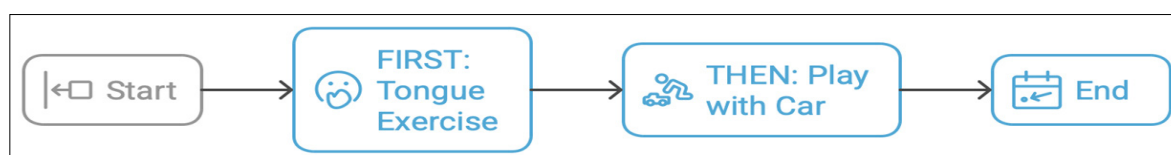
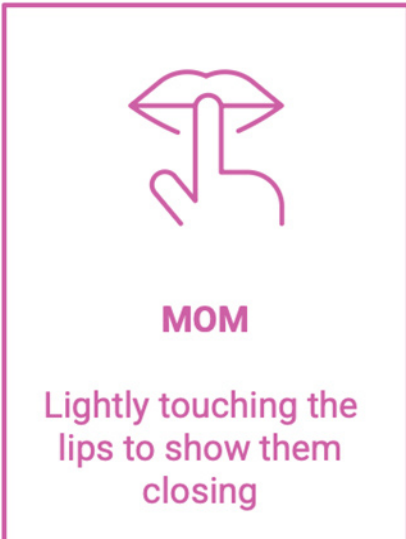


Figure 2. Example of a Visual Schedule for a Session with a Child with ASD

Source: Compiled by the author based on [37, 38].

- Childhood Apraxia of Speech (CAS): For children with CAS, who have impaired motor planning for speech movements, a multimodal approach, or “total communication,” is effective [39, 40]. Gestures and pictograms are used not as a substitute for speech, but as a “bridge” to it.
 - Example: When practicing the word “GIVE,” the SLP simultaneously says the word, shows the corresponding gesture (outstretched hand), and points to a pictogram of the word “GIVE.” The gesture serves as an additional kinesthetic and visual support (“anchor”) that helps the child’s brain plan and initiate the necessary sequence of articulatory movements [41–42].

Word/Sound	Pictogram (Example)	Description of Gesture/Tactile Cue
MOM		Lightly touching the lips to show them closing.

GIVE		An open, outstretched palm.
DRINK		A gesture mimicking lifting a cup to the mouth.

Figure 3. Examples of Gestural and Pictogram Supports for a Child with CAS

Source: Compiled by the author based on [41, 42].

The “Sensory Siren” Technique: Switching Focus Without Losing Motivation

The “Sensory Siren” is an author-developed technique for managing a child’s attention and arousal level during a session. When the SLP notices that the child is getting tired, losing focus, or, conversely, becoming too agitated, they activate a conditional signal—the “siren.” This could be a specific sound (a bell), a visual gesture, or a card. The signal means: “Attention! Sensory break!”

The break lasts 1-2 minutes and includes a short but intense sensory input, selected individually based on the diagnostic checklist (Table 2). The goal is to help the child’s nervous system “reboot” and return to an optimal state for learning. Examples of such breaks are based on sensory integration methods [43]:

1. For calming and concentration (for over-arousal):
 - o Deep Pressure: Firm “bear hugs,” being wrapped in a weighted blanket, squeezing with a massage ball.

- o Proprioceptive Input: A few push-ups against a wall or chair, carrying heavy (but safe) objects.
- o Oral-Motor Stimulation: Chewing on a special teether, blowing bubbles through a straw into water.
- 2. For activation and increasing tone (for fatigue):
 - o Vestibular Stimulation: A few quick swings on a swing, jumping on a trampoline or fitness ball.
 - o Tactile Stimulation: Playing with materials of contrasting textures (e.g., quickly plunging hands into a bowl of dry beans).

The “Sensory Siren” technique allows the session not to be interrupted due to “bad behavior,” but to constructively manage the child’s state, teaching them accessible methods of self-regulation and maintaining motivation for further work.

The “Siren” should be tailored to the child’s specific sensory profile.

For a hypo-sensitive, under-responsive child like Alex, the siren might signal a “fast” break: 30 seconds of jumping on a mini-trampoline to increase alertness.

For a hyper-sensitive, easily overwhelmed child, the siren would signal a “slow” break: sitting in a beanbag chair and slowly squeezing a stress ball to calm the nervous system. The key is to match the input to the child’s regulatory needs.

CHAPTER 4. THE FAMILY-SCHOOL SUPPORT SYSTEM

The success of speech therapy with a child with SEN depends directly on how effectively the acquired skills are generalized into their daily life. Isolated sessions in a therapy room, even of the highest quality, will not yield sustainable results without the active participation of the family and educators. This chapter describes the creation of a distributed therapeutic network in which the SLP acts as a facilitator, equipping the child’s immediate environment with simple and effective support tools. This allows for a manifold increase in the total “therapeutic time” and integrates the intervention work into the natural context of the child’s life.

The “Parent Triangle”: Short Video Guide, Daily Practice Card, Sticker Reward Chart

To organize effective home practice, the “Parent Triangle” model is proposed, consisting of three complementary components. This system is designed to solve common problems: parents don’t know how to perform the task correctly, the child doesn’t want to do it, and progress seems invisible.

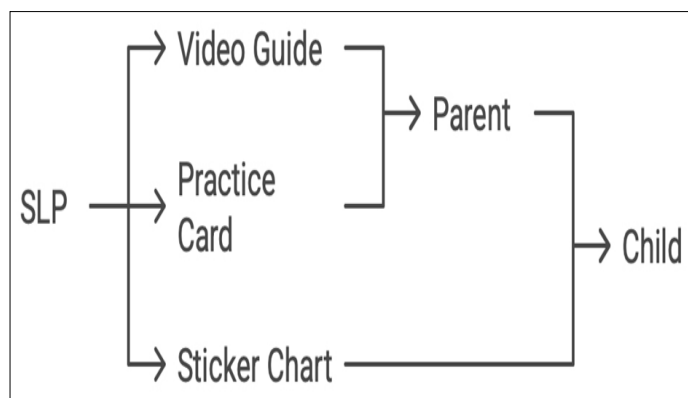


Figure 4. The “Parent Triangle” Model for Home Support

- **Short Video Guide (Answers “HOW?”):** Instead of long text instructions, the SLP records a short (1-2 minute) video for parents on a smartphone, demonstrating one specific exercise or game. For example, showing how to do an articulation exercise correctly or how to practice syllables in a ball game. This format, based on parent coaching principles, is much more visual and effective, as parents see and hear the correct model [44].
- **Daily Practice Card (Answers “WHAT?”):** This is a small laminated card with 2-3 simple, specific tasks for the day. For example: “1. Model ‘want ___’ when Alex points.

2. Blow bubbles together for 5 minutes. 3. Read one book and label 3 pictures.” A clear and limited list of tasks does not overwhelm parents and makes the goal achievable [26].

- **Sticker Chart for Reinforcement (Answers “WHY?”):** This is a visual motivation system for the child. A weekly chart is drawn on a piece of paper. For each completed task, the child and parent stick a sticker on it. At the end of the week, for the collected stickers, the child receives a small prize (not necessarily material—it could be a trip to the park or watching a cartoon). This system makes progress visible and celebrates even the smallest successes, which increases the child’s intrinsic motivation [45–47].

The Teacher’s Role: Triggering New Sound Use in Class, Monitoring Correctness

Educators (preschool and school teachers) are crucial allies in the skill generalization process. Their task is to create situations in the group or classroom where the child can apply their new speech skills in a natural environment. The SLP conducts brief consultations for educators, explaining current goals and offering specific ways to provide support [17].

Examples of recommendations for the teacher:

- **Create a Communicative Situation:** Ask the child a question whose answer is likely to contain the target sound (e.g., asking “What’s in the thimble?” if the [th] sound is being targeted).
- **Positive Reinforcement:** When noticing the child has correctly produced a sound in spontaneous speech, praise them unobtrusively (“You said the word ‘sun’ so beautifully!”).
- **Gentle Correction (if appropriate):** If the child makes a mistake, you can gently provide the correct model without focusing on the error (“You want juice? Yes, this is s-s-juice”).
- **Monitoring:** Observe the child’s speech throughout the day and briefly report their successes or difficulties to the SLP.

This involvement of the educator helps the child understand that speech skills are important not only in sessions with the SLP but also in real life, in communication with peers and other adults [48].

Shared Digital Log (Google Sheet) for SLP, Parents, and Teacher

To ensure effective and transparent communication among all members of the support team, it is proposed to use a shared digital log, created, for example, on the Google Sheets platform. This tool allows for the creation of a single information field, accessible to all parties in real-time [49, 50].

The log (see Table 4) solves several key problems:

- **Goal Transparency:** All participants see which specific goals are being worked on at the moment.
- **Action Coordination:** Parents see what was done in the session and receive a clear homework assignment. The teacher sees the homework and can support its completion at school/preschool.
- **Prompt Feedback:** Parents and teachers can leave their comments and observations, which the SLP can see

before the next session and take into account when planning.

- **Progress Documentation:** The log serves as an archive that records the entire history of the work, which is useful for analyzing dynamics and preparing reports.

Using such a shared document eliminates the problem of “fragmented” communication (where the SLP communicates with parents, and parents with the teacher, but there is no unified picture) and forms a true, cohesively working team [51, 52].

Table 4. Template for a Shared Digital Communication Log

Source: Compiled by the author based on an analysis of communication logs [49–51].

Date	Weekly Goal (from SLP)	Session Activity (filled by SLP)	Result / Comment (filled by SLP)	Home Practice (filled by SLP)	Parent Comment	Teacher’s Classroom Observation
Oct 1	Use “want” + gesture to request.	Play with bubbles, cars, blocks. Modeled “want car.” Used hand-over-hand to help Alex point.	Alex imitated “want” twice with a model. Very motivated by bubbles.	1. During snack, model “want cookie.” 2. Play with cars for 5 min, ask “What do you want?”	He said “wa” and pointed to his cup at dinner!	Alex pointed to the blocks today and grunted. I said “Oh, you want blocks!” and gave them to him.
Oct 8	...	...	...	...	...	...

CHAPTER 5. PROGRESS MONITORING AND PLAN ADJUSTMENT

Monitoring within this methodology serves a dual function. First, it is a clinical function: collecting objective data to evaluate the effectiveness of the intervention and to make timely adjustments to the individual plan. Second, it is a psychological function: managing the motivation and expectations of all participants in the therapeutic process. The monitoring system must be simple, visual, and supportive, especially in conditions of slow progress, which is characteristic of children with SEN.

Weekly “Before/After” Audio Recording Analysis Using a “+ / ± / -” Scale

One of the most objective and convincing ways to track progress in sound production is regular audio recording.

- **Procedure:** At the beginning of the week (e.g., on Monday), parents are asked to record a short audio file on their smartphone’s voice recorder, where the child performs a standard task (e.g., names 5-10 target pictures or repeats several phrases). At the end of the week (on Friday), the SLP makes a similar recording during the session.
- **Analysis:** Comparing the two recordings allows for an objective, “by ear” assessment of even minimal changes in pronunciation quality, speech rate, or verbal activity. These recordings can be saved in a shared folder (e.g., on Google Drive) so that parents can also visually track the dynamics.
- **Evaluation:** To quickly document results in the shared digital log (see Table 4), a simple three-point scale is

used, similar in spirit to the “Assessment” section of SOAP notes [53, 54]:

- “+” (Plus): Clear positive shift, the skill has become more stable.
- “±” (Plus-Minus): The result is unstable, the skill appears sporadically, further reinforcement is needed.
- “-” (Minus): No progress or regression is observed, a revision of tactics or goals is required.

This approach makes monitoring less labor-intensive for the specialist and more understandable and motivating for parents, who receive objective proof that their efforts are yielding results.

Micro-Success Criteria: Even One Correctly Repeated Sound Counts

A key aspect of psychological support for all participants is the ability to notice and celebrate micro-successes. For a child with severe speech disorders, especially with apraxia or dysarthria, even a single correct attempt to produce a new sound or syllable is a huge achievement, the result of great effort.

Recognizing these small victories [47]:

- **Boosts the child’s self-esteem and motivation:** They receive confirmation that their efforts are not in vain, which encourages them to try again [45].
- **Helps parents see progress:** Parents who expect quick and large-scale changes may not notice these small steps. By highlighting them, the SLP helps them adjust their focus and appreciate the real dynamics [46].

- Supports the therapist: For the specialist, documenting micro-successes is also a source of professional satisfaction and a resource for preventing burnout.

The celebration can be very simple: sincere praise, a high-five, a sticker on the chart, an enthusiastic reaction. The main thing is to make the achievement visible and significant for the child and their family.

The Slow Dynamics Rule: Managing Expectations and Therapist Resilience

One of the author's principles states: "Do not expect quick results from a child with special educational needs. New skills are formed very slowly in them." This thesis is the basis for managing parents' expectations and preventing the specialist's professional burnout.

From the very beginning of the work, it is necessary to honestly and openly discuss realistic timelines and possible difficulties with parents. It is important to explain that the development of a child with SEN can be uneven, with periods of plateau or even small regressions. Transparency in this matter helps to avoid unfounded hopes and subsequent disappointments, reduces parental anxiety, and strengthens trust in the specialist [26].

What to do when... a parent asks, "When will he start talking in full sentences?"

1. Validate the Emotion: "I hear how much you want to have those bigger conversations with him. That's a wonderful goal."
2. Refer to the Plan: "Right now, our plan is focused on a crucial first step: combining two words. As you can see from our goal map (Table 3), he's making steady progress on that."

3. Explain the Process: "Building sentences is like building with LEGOs. First, we have to master connecting two blocks together reliably. Once that's strong, we can start adding a third."
4. Reiterate Partnership: "The work you're doing at home is exactly what helps us build that strong foundation. Let's talk about what we can try this week."

Working with children with severe disorders also requires enormous emotional and physical resources from the specialist. Constant pressure, high expectations from parents, and slow progress can lead to stress and professional burnout. Research shows that developing resilience is a key factor in maintaining the mental health of teachers in special education [55].

Practical steps to maintain resilience:

- Focus on the process, not just the result: Find satisfaction in the quality of the established rapport with the child, in a well-conducted game, and not only in achieving the final goal.
- Recognize the limits of one's influence: Understand that the result depends on many factors (the child's health, family situation, resources), and the SLP cannot control them all.
- Celebrate micro-successes (see section 5.2): This is important not only for the child and parents but also for the therapist.
- Professional support: Regular supervision, communication with colleagues, and sharing experiences help to cope with feelings of isolation and find new solutions.

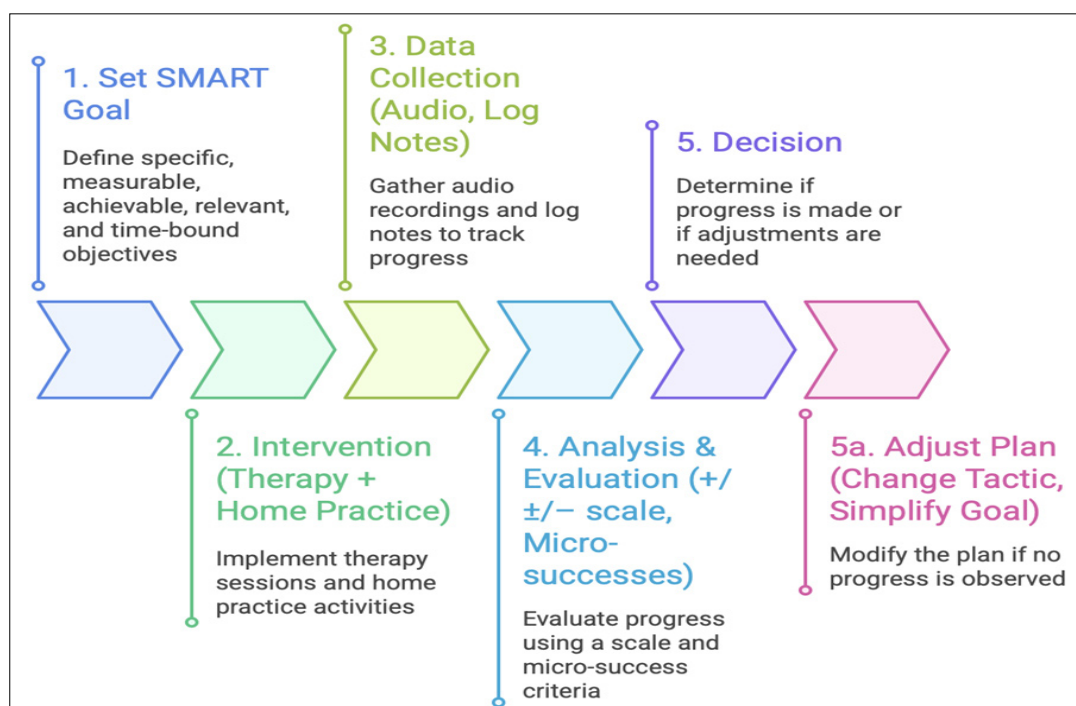


Figure 5. The Cycle of Progress Monitoring and Intervention Plan Adaptation

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This cyclical process (see Figure 5) allows for a flexible and timely response to changes in the child's condition, adapting the intervention plan and maintaining the stability of the therapeutic system in the long term.

Table 5. Example of a Progress Tracker Based on Weekly Audio Recordings

Source: Compiled by the author based on monitoring methodologies [53, 56].

Week	Target Sound/ Word	Link to "Before" Audio (Mon)	Link to "After" Audio (Fri)	Rating (+/-)	SLP's Comment
1	Voiceless [th] sound in isolation	[link_1]	[link_2]	±	Sound is emerging with imitation, but often replaced with [f]. Fricative quality is weak.
2	Voiceless [th] sound in isolation	[link_3]	[link_4]	+	Sound is more stable and clear after introducing the tongue-tip-out exercise.
3	Syllable "thuh"	[link_5]	[link_6]	±	Produces [th] well in isolation, but the sound is lost when transitioning to the vowel.
4	Syllable "thuh"	[link_7]	[link_8]	+	In the "thinking" game with gesture support, the syllable is produced correctly in 7/10 trials. Great progress!

CONCLUSION

This handbook has systematized a learner-centred, play-based approach to speech-language therapy for children with special educational needs. This methodology shifts the focus from the mechanical correction of a speech defect to the creation of a holistic developmental ecosystem around the child, where each participant—SLP, parent, educator—plays an active and coordinated role.

Key advantages of the approach:

- **High Child Motivation:** Using play as the leading activity and following the child's interests fosters internal, rather than external, motivation for speech activities.
- **Effective Skill Generalization:** Building a "Family-School" partnership system and using practical tools (video guides, digital logs) ensures the transfer and reinforcement of skills in the natural environment, which is the key to their functionality.
- **Flexibility and Individualization:** Diagnostic tools are aimed at identifying not only deficits but also the child's unique sensory and emotional profile, which allows for flexible adaptation of the session structure and content.
- **Holistic Personality Development:** The approach is aimed not only at improving speech but also at developing self-regulation, self-confidence, initiative, and communicative intent, viewing speech as a tool for understanding the world and building relationships.

The central idea running through the entire handbook is that success in working with children with SEN is a marathon, not a sprint. It requires immense patience and multilateral cooperation. Managing expectations, celebrating micro-successes, and focusing on building a trusting therapeutic alliance are components of success that are just as important as the intervention techniques themselves.

The future development of this methodology lies in the integration of modern technologies. In the future, it is possible

to develop interactive articulation cards with augmented reality (AR) elements, which would make exercises even more visual and engaging. Furthermore, the creation of a unified online platform that combines the functionality of a digital log, a library of video guides for parents, and tools for telepractice could elevate the support system to a new level of accessibility and efficiency.

REFERENCES

1. Quick Statistics About Voice, Speech, Language // NIDCD. NIH.gov. URL: <https://www.nidcd.nih.gov/health/statistics/quick-statistics-voice-speech-language>
2. Nearly 240 million children with disabilities around the world, UNICEF's most comprehensive statistical analysis finds. URL: <https://www.unicef.org/press-releases/nearly-240-million-children-disabilities-around-world-unicefs-most-comprehensive>
3. New report highlights neglected health needs of children with developmental disabilities. URL: <https://www.who.int/news/item/15-09-2023-new-reports-highlights-neglected-health-needs-of-children-with-developmental-disabilities>
4. Global report on children with developmental disabilities // UNICEF. URL: <https://www.unicef.org/media/145016/file/Global-report-on-children-with-developmental-disabilities-2023.pdf>
5. Regulations on the interdisciplinary team providing psychological and pedagogical support for students with disabilities, children with disabilities. URL: https://school2-bor.edu.yar.ru/lokalnie/polozhenie_o_mezhdistsiplinarnoy_komande.pdf
6. Rilveria, J. R. C. (2022). Systemic Therapeutic Alliance in the Context of Pediatric Interventions for Neurodevelopmental Disorders. Acad J Ped Neonatol, 12(1), 555883. URL: <https://juniperpublishers.com/ajpn/pdf/AJPN.MS.ID.555883.pdf>

7. Loeb, D. F., Davis, E. S., & Lee, T. (2021). Collaboration between child play therapy and speech-language pathology: Case reports of a novel language and behavior intervention. *American Journal of Speech-Language Pathology*, 30(6), 2414-2429. URL: https://pubs.asha.org/doi/10.1044/2021_AJSLP-20-00310
8. Danger, S., & Landreth, G. (2005). Child-centered group play therapy with children with speech difficulties. *International Journal of Play Therapy*, 14(1), 81. URL: https://www.researchgate.net/publication/232525881_Child-Centered_Group_Play_Therapy_with_Children_with_Speech_Difficulties
9. Child-Centered Group Play Therapy with Children with Speech Difficulties. URL: <https://www.semanticscholar.org/paper/Child-Centered-Group-Play-Therapy-with-Children-Danger-Landreth/c472b0562ab1979640fb414d4cc90d459e582c14>
10. Communication Disorders: Approaches to Early Intervention // AbilityPath. URL: <https://abilitypath.org/ap-resources/communication-disorders-approaches-to-early-intervention/>
11. Dijkstra-de Neijs, L., Tisseur, C., Kluwen, L. A., Van Berckelaer-Onnes, I. A., Swaab, H., & Ester, W. A. (2023). Effectivity of play-based interventions in children with autism spectrum disorder and their parents: A systematic review. *Journal of Autism and Developmental Disorders*, 53(4), 1588-1617. URL: <https://playproject.org/wp-content/uploads/2023/08/Dijkstra.pdf>
12. Francis, G., Deniz, E., Torgerson, C., & Toseeb, U. (2022). Play-based interventions for mental health: A systematic review and meta-analysis focused on children and adolescents with autism spectrum disorder and developmental language disorder. *Autism & Developmental Language Impairments*, 7, 23969415211073118. URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC9685160/>
13. Bogetz, J. F., Trowbridge, A., Lewis, H., Jonas, D., Hauer, J., & Rosenberg, A. R. (2022). Forming clinician-parent therapeutic alliance for children with severe neurologic impairment. *Hospital Pediatrics*, 12(3), 282-292. URL: <https://pubmed.ncbi.nlm.nih.gov/35141756/>
14. Klatte, I. S., Lyons, R., Davies, K., Harding, S., Marshall, J., McKean, C., & Roulstone, S. (2020). Collaboration between parents and SLTs produces optimal outcomes for children attending speech and language therapy: Gathering the evidence. *International Journal of Language & Communication Disorders*, 55(4), 618-628. URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC7383473/>
15. Fan, Q., Yu, X., Cheng, W., Su, L., Zhang, Y., Liu, Q., & Wu, Z. (2024). The effectiveness of therapist-led family-centered language intervention for children with language delay. *Translational Pediatrics*, 13(10), 1720. URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC11543118/>
16. Cahill, P. T., Ng, S., Turkstra, L. S., Ferro, M. A., & Campbell, W. N. (2024). Exploring the valued outcomes of school-based speech-language therapy services: a sequential iterative design. *Frontiers in Rehabilitation Sciences*, 5, 1290800. URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10834652/>
17. Paccaud, A., Keller, R., Luder, R., Pastore, G., & Kunz, A. (2021, April). Satisfaction with the collaboration between families and schools—the parent's view. In *Frontiers in Education* (Vol. 6, p. 646878). Frontiers Media SA. URL: <https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2021.646878/full>
18. Sensory Processing Checklist Signs Of Tactile Dysfunction Speech. URL: <https://speechtherapylincolne.com/wp-content/uploads/2020/03/Sensory-Processing-Checklist.pdf>
19. Selective Mutism // ASHA. URL: <https://www.asha.org/practice-portal/clinical-topics/selective-mutism/>
20. How to Identify Sensory Triggers | And Next Comes L // Hyperlexia Resources. URL: <https://www.andnextcomesl.com/2023/11/how-to-identify-sensory-triggers.html>
21. Evidence Based Interventions for Speech-Language Pathology // Parallel Learning. URL: <https://www.parallellearning.com/post/evidence-based-interventions-for-speech-language-pathology>
22. 7 Phonological Awareness Strategies in Speech Therapy // SLP Now. URL: <https://slpnow.com/blog/phonological-awareness/>
23. 8 Traditional Target Selection Criteria // speech language therapy. URL: https://www.speech-language-therapy.com/index.php?option=com_content&view=article&id=43:target&catid=11:admin
24. DeVeney, S. L., Cabbage, K., & Mourey, T. (2020). Target selection considerations for speech sound disorder intervention in schools. *Perspectives of the ASHA Special Interest Groups*, 5(6), 1722-1734. URL: https://pubs.asha.org/doi/10.1044/2020_PERSP-20-00138
25. A Guide to Preschool Speech Therapy Goals for Parents | WT // Wee Talkers. URL: <https://www.weetalkers.com/blog/preschool-speech-therapy-goals>
26. How SLPs Can Collaborate with Parents: 10 Strategies for Success // USAHS. URL: <https://www.usa.edu/blog/how-slp-s-can-collaborate-with-parents-10-strategies-for-success/>
27. Speech-Language Pathology IEP Goals: A Complete Guide and Goal Bank. URL: <https://www.parallellearning.com/post/speech-language-pathology-iep-goals-a-complete-guide-and-goal-bank>
28. Speech IEP Goals: Speech Therapy Made Simple //

- eLuma. URL: <https://eluma.com/blog/speech-iep-goals-speech-therapy-made-simple/>
29. 432+ Free Measurable IEP Goals and Objectives Bank // Speech Therapy Store. URL: <https://www.speechtherapiststore.com/iep-goal-bank/>
30. Distance Learning Series: Articulation // The Speech Express. URL: <https://www.thespeechexpress.com/blog/distance-learning-series-articulation>
31. 5-Minute Articulation Activities for Children // Speech Improvement Center. URL: <https://speechimprovementcenter.com/5-minute-articulation-activities-2/>
32. 10 Fun Articulation Games Your Child Will Love // Otsimo. URL: <https://otsimo.com/en/10-articulation-games-children-autism/>
33. Understanding Gross Motor Delays // PedsTeam. URL: <https://pedsteam.com/understanding-gross-motor-delays-signs-therapy-and-early-intervention/>
34. Understanding Gross Motor Skills // District Speech and Language Therapy. URL: <https://districtspeech.com/understanding-gross-motor-skills/>
35. Using Visual Schedules to Support Speech Therapy Progress. URL: <https://www.heartwisesupport.org/post/using-visual-schedules-to-support-speech-therapy-progress>
36. The Benefits of Visual Schedules for Children. URL: <https://www.biermanautism.com/resources/blog/visualschedules/>
37. Using Visual Schedules to Help Kids with Autism: A Brief Guide // Strive ABA Consultants. URL: <https://striveabaconsultants.com/help-kids-with-autism-a-brief-guide/>
38. How to Implement Visual Schedules for Children with Autism. URL: <https://www.advancedautism.com/post/how-to-implement-visual-schedules-for-children-with-autism>
39. What About Sign Language, Speech Tablets, and Other Communication Forms? URL: https://www.apraxia-kids.org/apraxia_kids_library/what-about-sign-language-speech-tablets-and-other-communication-forms/
40. Morgan, A. T., Murray, E., & Liegeois, F. J. (2018). Interventions for childhood apraxia of speech. *Cochrane Database of Systematic Reviews*, (5).. URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC6494637/>
41. Childhood Apraxia of Speech (CAS) 101 - Undivided. URL: <https://undivided.io/resources/childhood-apraxia-of-speech-cas-101-2759>
42. Augmentative and Alternative Communication (AAC) // ASHA. URL: <https://www.asha.org/practice-portal/professional-issues/augmentative-and-alternative-communication/>
43. Sensory Integration Therapy in Paediatric Rehabilitation // Physiopedia. URL: https://www.physio-pedia.com/Sensory_Integration_Therapy_in_Paediatric_Rehabilitation
44. 15 Easy Speech Therapy Exercises Parents Can Use at Home // Expressable. URL: <https://www.expressable.com/learning-center/tips-and-resources/15-speech-therapy-strategies-for-parents-to-use-at-home>
45. The Importance of Celebrating Small Wins in ABA Therapy. URL: <https://www.ambitionsaba.com/resources/the-importance-of-celebrating-small-wins-in-aba-therapy>
46. Celebrating Your Child with Autism - Innovative Behavior Options. URL: <https://behavioroptions.com/celebrate-your-familys-accomplishments/>
47. How to Celebrate Small Wins in Your Child's Development - Kids First Services. URL: <https://www.kidsfirstservices.com/first-insights/how-to-celebrate-small-wins-in-your-child-s-development>
48. RESEARCH HIGHLIGHT: Facilitating parental involvement in children's speech therapy. URL: <https://crane.osu.edu/our-work/research-highlight-facilitating-parental-involvement-in-childrens-speech-therapy/>
49. 3 Simple Strategies for Effective Parent Communication in Speech Therapy. URL: <https://thespeechroomnews.com/2023/07/parent-communication-in-speech-therapy.html>
50. Streamlining Your Speech Therapy Paperwork: My Go-To Systems // The SLT Scrapbook. URL: <https://thesltscrapbook.com/2025/02/paperwork-systems-for-slps/>
51. Therapy Communication Log // TPT. URL: <https://www.teacherspayteachers.com/browse?search=therapy%20communication%20log>
52. 4 Ways I Communicate with Parents - Simply Special Ed. URL: <https://www.simplyspecialed.com/4-ways-i-communicate-with-parents/>
53. SOAP Notes for Speech Therapy: The Ultimate Guide // TheraPlatform. URL: <https://www.theraplatform.com/blog/491/soap-notes-for-speech-therapy-the-ultimate-guide>
54. SOAP Notes for SLPs and Speech Therapy with Examples // SimplePractice. URL: <https://www.simplepractice.com/blog/soap-notes-for-slps-with-examples/>
55. Zhang, M., Bai, Y., & Li, Z. (2020). Effect of resilience on the mental health of special education teachers: Moderating effect of teaching barriers. *Psychology Research and Behavior Management*, 537-544.. URL: <https://pmc.ncbi.nlm.nih.gov/articles/PMC7342498/>

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56. Articulation Progress Monitoring & Data Collection
| Speech Service Notes - TPT. URL: <https://www.teacherspayteachers.com/Product/Articulation->

Progress-Monitoring-Data-Collection-Speech-Service-Notes-1981943

Appendix A: Initial Observation Checklist Template

Child's Name: _____ Date: _____ Observer: _____

Sensory System / Behavior	Hypersensitivity (Avoids Stimuli)	Hyposensitivity (Seeks Stimuli)	Notes / Behavioral Examples
Tactile	– Avoids touch, messy play – Reacts to clothing tags – Resists grooming	– Constantly touches – Loves tight hugs – Doesn't notice mess/injury	
Auditory	– Fears loud noises – Covers ears – Distracted by background sounds	– Loves loud sounds – Makes loud sounds – Doesn't respond to name	
Vestibular	– Afraid of swings, slides – Moves cautiously – Gets motion sickness	– Loves to spin, rock, jump – Constantly in motion – Rocks on chair	
Visual	– Irritated by bright light – Visually distracted – Avoids eye contact	– Loves bright/flashing lights – Stares at details	
Attention	– Tires quickly – Difficulty with transitions – Anxious in new settings	– Short attention span – Impulsive	

Appendix B: SMART Goal Map Template

Child's Name: _____

Time Period: _____

Period	Goal	Success Criterion
Long-Term Goal		
Week 1		
Week 2		
Week 3		
Week 4		

Appendix C: Shared Digital Communication Log Template

Date	Weekly Goal (from SLP)	Session Activity (filled by SLP)	Result / Comment (filled by SLP)	Home Practice (filled by SLP)	Parent Comment	Teacher's Classroom Observation

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