

Caregivers' Guide: Activity schedules on iPads for children with autism

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ABSTRACT

This paper explains how caregivers can create activity schedules on iPads for their children with autism and teach them to follow these schedules independently. It also describes how the prerequisite skills to follow activity schedules can be taught via iPads. Compared with previous paper-based methods, iPad schedules take less time and effort to prepare, increase engagement and decrease overlearning, are easier to use and provide more instant gratification for children with autism. Activity schedules help individuals with autism independently organize and control their lives, increase their social interaction skills and ability to make choices. Yet, it is very difficult to carry the activity schedules that are in multiple bulky folders and their audio components that are in voice recorders and sizeable audio card readers to places outside the school and home, such as restaurants or family visits. Fortunately, the entire activity schedule can be fitted into a single iPad application, in which voices and videos can be recorded as well, which eliminates the need to carry the voice recorders or the audio card readers. iPads are so common that they don't stand out in social settings, decreasing children's self-consciousness about being "different", and they are easy to use, customize, and carry around. The games, such as puzzles, that will keep the children engaged and prevent them from performing their stereotypical behaviors at outside settings are difficult to be carried around, but not when they are in iPads. This paper also explains data collection methods to observe children's learning success and the steps to follow after children master their first activity schedule.

Key words: autism; ABA; applied behavioral analysis; activity schedule; iPad, technology; tablet; assistive technology; portable device.

The purpose of this paper is to provide a guide for caregivers on how to create activity schedules on iPads for their children with autism and how to teach them to follow these schedules independently. Individuals with autism are impaired in social interaction and communication, and they have repetitive, restricted, stereotyped behavior patterns and interests (American Psychiatric Association, 2000). They depend on adults to stay on-task and to complete their activities (Bryan & Gast, 2000). They constantly need a caregiver or a teacher to tell them what to do. When left on their own, they just sit and do nothing productive or meaningful all day, such as looking at the wall or out the window for hours.

An **activity schedule** is an invaluable tool to help individuals with autism gain independence over their lives, learn to make choices, and improve their social interaction, all of

which are areas of difficulty for individuals with autism. An activity schedule is a set of words or pictures cuing a person to engage in a sequence of activities, which enables individuals with autism to perform activities and tasks without requiring direct prompting and guidance by their caregivers (McClannahan & Krantz, 2010).



Figure 1: Paper-based activity schedules

The teaching method explained in this paper follows principles of **Applied Behavioral Analysis (ABA)** because ABA is an effective way to systematically teach skills to individuals with autism and reduce their problematic behaviors (Jensen & Sinclair, 2002). Experts assert that the only interventions that yield comprehensive and lasting results in the education of individuals with autism are based on ABA principles (Foxx, 2008). According to the US National Standards Report on Autism, ABA:

- a) increases more than half the skills often targeted to be increased (such as academic, communication, interpersonal, and self-regulation), whereas other established treatments increase a smaller range of skills,
- b) results in favorable outcomes for more behaviors targeted to be decreased (such as restricted, repetitive, nonfunctional patterns of behavior, interests, or activities) than other established treatments, and
- c) provides favorable outcomes for all age groups (0-2, 3-5, 6-9, 10-14, 15-18, 19-21), whereas other established treatments were only effective for certain age groups (National Autism Center, 2009).

Yet, the fact that Applied Behavioral Analysis methods are paper-based has several important disadvantages that can be eliminated with the use of iPads:

1. Heavy burden on parents and teachers of preparing large amounts of materials (collecting, printing, laminating pictures; preparing multiple folders for different activities),
2. Difficulty of teaching dynamic concepts such as verbs effectively on paper,

3. Lack of adequate variety in paper-based contents, which makes children over-learn the concepts from their available exemplars, get bored, or have difficulties in generalizing (Venkatesh et al., 2012).

Moreover, these bulky folders are hard to carry around when families take their children with autism out to restaurants, movies, or shopping. These activity schedules are not only a physical burden, but they may also be a psychological burden. These folders may cause children to stand out and get unwanted attention from the public, making them feel self-conscious and uncomfortable. Instead of helping, this may exacerbate their social problems.



Figure 2: An activity schedule's size

We asked autism educators in Tohum, Foundation for Education and Early Diagnosis of Autism in Turkey:

In your opinion, what are the benefits of using iPads for activity schedules instead of folders, voice recorders, and audio card readers?

“The quality of voice recorders is very poor and they are only good for one month, even if you replace the batteries, they don't work as well. The recorded voices are not clear and the syllables are difficult to hear and distinguish. The recordings on iPad not only relieve us of the need to buy new voice recorders every month, but also are very clear and easy to understand”

“The usage of audio recording cards is very limited. You can't hang them on walls or stairs, and you need to carry their audio card reader with you if you want to use these cards. Using the iPad instead is much more practical.”

“When Zeynep has her iPad, she doesn't engage in her stereotype of saying things that are unrelated to what is going on around her, things that are out of context.”

“ When you leave Ata on his own, he clenches his teeth, hits his hands, looks elsewhere and cuts his communication with the outer world. But when he is playing with his iPad, his engagement is very high and he doesn't engage in any of his stereotypical behaviors.”

“Semih's stereotypical behaviors are playing with his hands and crossing his eyes. But when he is playing with his iPad, he doesn't take his eyes off it, his engagement is very high. He already loved playing with puzzles, and he was exhilarated when he saw that he could now play them in the iPad!”

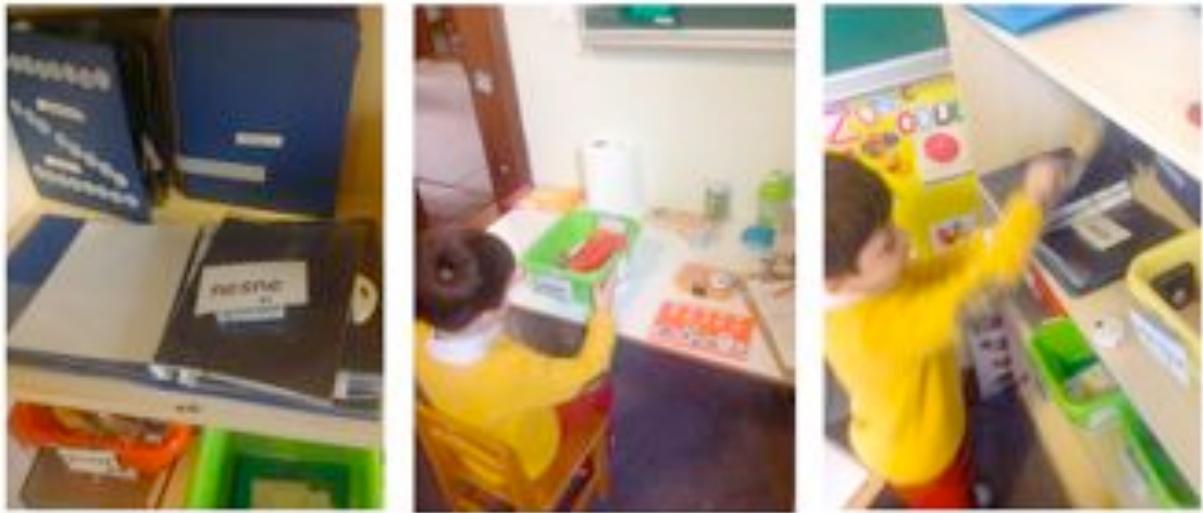


Figure 3: Yağız following his paper-based activity schedule



Figure 4: Yağız's twin brother Emre following his activity schedule on iPad

These limitations can be overcome with the use of iPads. The well-structured system of ABA allows it to be delivered through iPads. The vast amount of different media material that is available on iPads not only helps prevent overlearning, but also helps increase engagement: children with autism have strong affinities for specific domains, and personalizing the stimuli with those favorites increase their engagement (Venkatesh et al., 2012). The use of mobile devices in the special needs community is endorsed because of their flexible multimedia content, mobility, affordability, and the appealing and simple nature of the touch screen (Yee, 2012).

Other advantages of iPads for individuals with disabilities are the following:

- Available applications easily and cheaply replace bulky and expensive older assistive technology
- iPads give the children a sense of independence they may have never experienced before
- Touch screen is easier to use than a mouse or a laptop for children with poor fine motor skills
- The large screen is friendly towards individuals with vision problems
- Simple to use
- Easy to customize
- Instant gratification from touch screens for children who are not patient or who cannot grasp the connection between a mouse and computer screen (Shah, 2011).

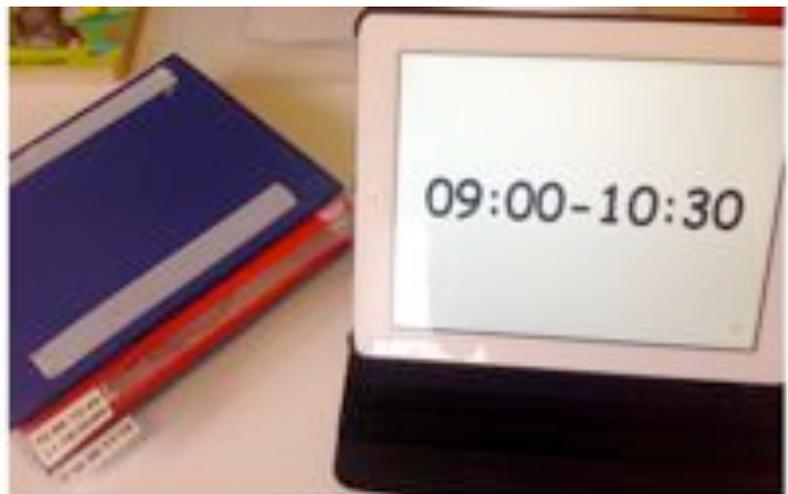


Figure 5: Activity schedules in iPads instead of folders take less time and effort to prepare

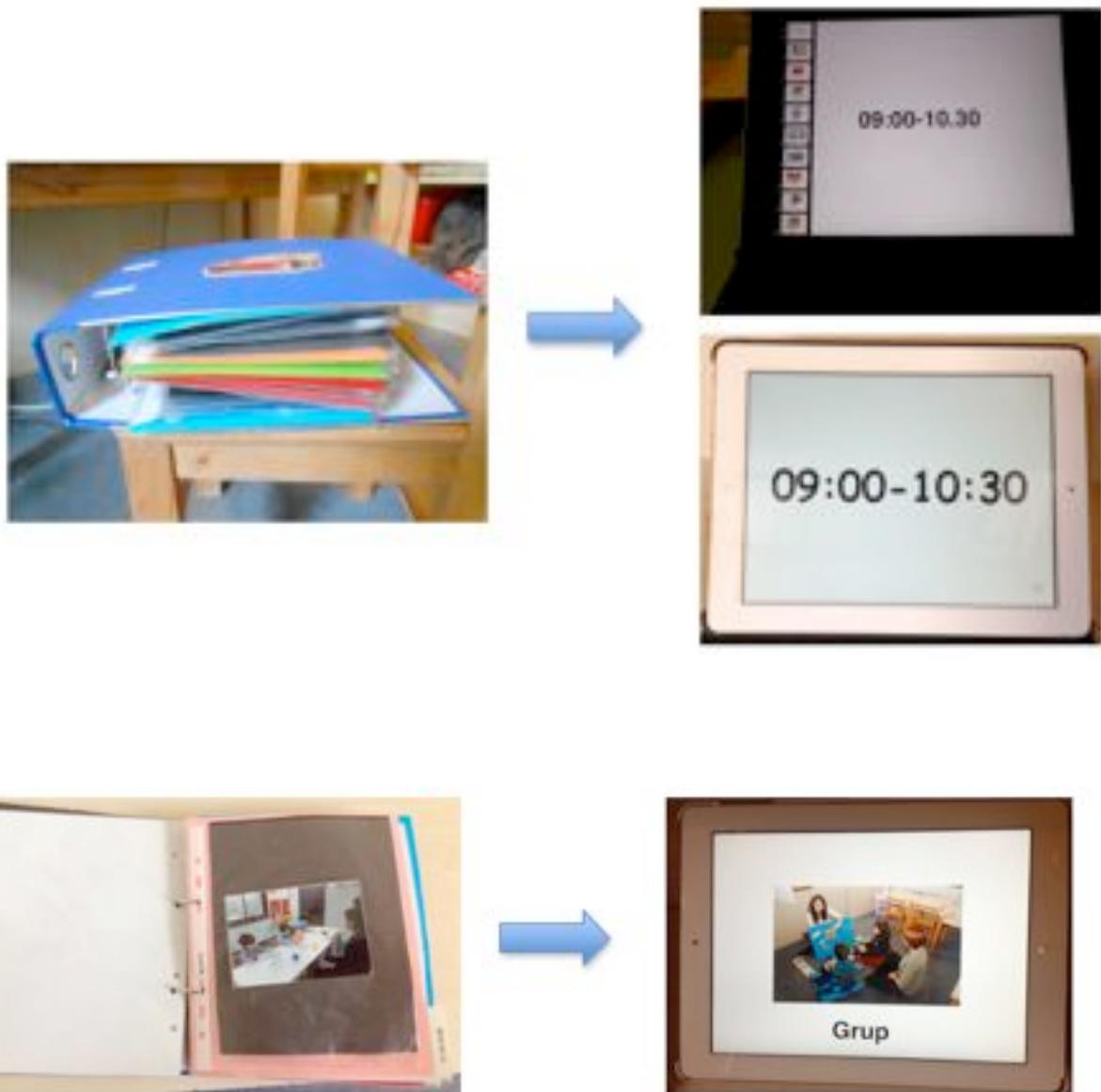


Figure 6: The old and the new way of preparing activity schedules for children with autism

Does Your Child Have the Prerequisite Skills?

Before you start preparing your child's activity schedule, go over the checklist below to see if your child is ready to follow an activity schedule. Your child:

- ✓ Can differentiate pictures from the background
- ✓ Can match identical objects
- ✓ Can associate the picture with the corresponding real object
- ✓ Allows manual guidance

If your child is lacking in any of these skills, it can be taught with an iPad. First, here are some basic principles you should be familiar with before we go on with how to teach these prerequisite skills.

Box 1: How to Reinforce a Desired Behavior

(Adapted from *Applied Behavior Analysis* by Cooper, Heron, & Lewand, 2007)

When a behavior is followed by the presentation of a desired stimulus or the removal of an aversive stimulus, this increases the likelihood that this behavior will be repeated in the future and this is called **reinforcement**.

- Reinforcement strengthens any behavior that immediately precedes it → it is very important to immediately deliver the reinforcement after the desired behavior without delay

What are the types of reinforcers?

- Edible reinforcers: bites of preferred foods, snacks, candy, and sips of drinks
- Sensory reinforcers: vibration from a massager, tactile stimulation by tickling or stroking, flashing lights, music
- Tangible reinforcers: stickers, small toys
- Activity reinforcers: opportunity to perform a desired activity, such as playing a game, listening to music, playing with a ball
- Social reinforcers: physical contact such as hugging, proximity such as being near someone, attention, and praise

How to use the reinforcers

1. When teaching a new behavior, give reinforcement for each occurrence of the target behavior.
2. After this target behavior is established, gradually decrease the rate of reinforcement by rewarding some but not all of the behavior occurrences.
Example: after the initial learning, give a reinforcer after two correct responses, then after four correct responses, and so on.
3. Integrate descriptive praises into this reinforcement process: give a sign of social approval and describe why you are giving this approval. *Example*: Smile and say "Great job! I love the way you cleaned your table!"

Box 2: How to Teach a Skill using ABA Principles

These are the fundamental steps of teaching a skill to your child using principles of Applied Behavioral Analysis. Following these steps will help you when teaching any skill to your child, so we advise you to get a print out of it and refer to it whenever you need.

- Determine target skill
- Break down the skill into simple steps
- Ask the child to perform the intended skill
- If child doesn't perform what is asked, direct her to the correct response using prompts
- If correct response is not given, manually guide the child to perform the correct response and try to prevent the child from engaging in an incorrect response
- Reinforce (give a reward) immediately after the correct response
- Repeat these steps
- Fade the prompts and lessen the reinforcements as the child performs better, start giving reinforcements for the correct completion of more complex behaviors

Teaching the Prerequisite Skills for an Activity Schedule

Educators have written books for parents and other caregivers with instructions on how to teach these prerequisite skills via paper-based methods. Based on the principles in McClannahan and Krantz's *Activity Schedules for Children with Autism* (2010), here we explain how to *teach those skills using iPads so that caregivers are not burdened with preparing a multitude of materials.*

What's new?

Skill 1: Differentiating pictures from the background

- Install the free application Doodle Buddy from the Application Store.
- Get a sheet of paper and prepare a Data Sheet to track your child's responses.

Opportunity Number	Task	Date and Time	Date and Time	Date and Time
	Picture versus background	06/10/2013 10 a.m.		
1		+		
2		-		
3		-		
4		-		
5		+		
6		+		
7		-		
8		-		
9		+		
10		+		
Number of Correct Responses		5		

Table 1: Sample data sheet to record and track your child's responses (from McClannahan & Krantz, 2010)

- Start the application Doodle Buddy. From the toolbox on the bottom, choose the second tool from the left, the one that looks like a stamp.

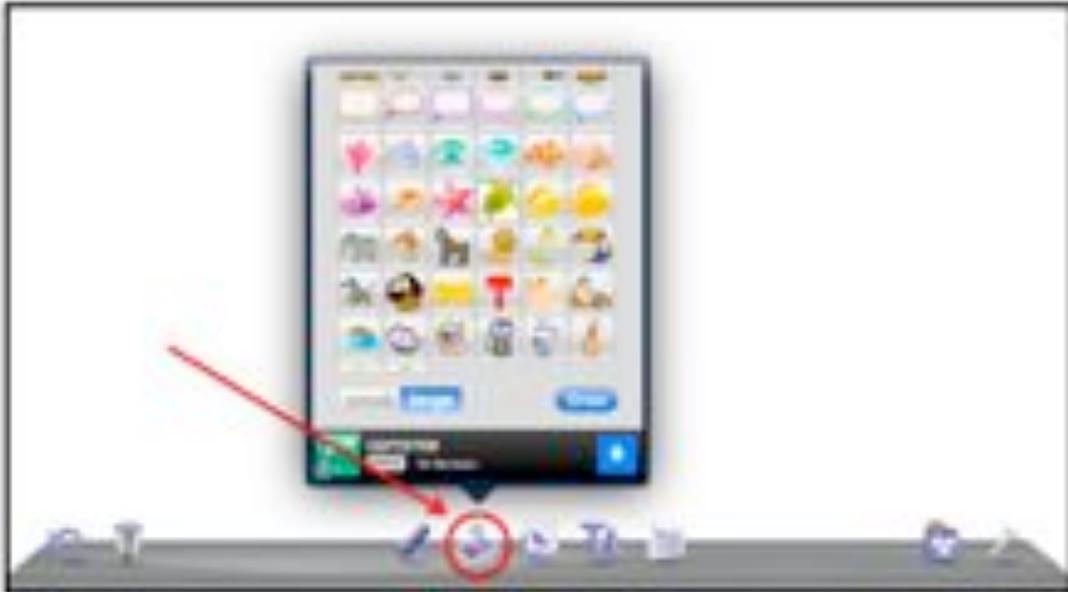


Figure 7: Doodle Buddy application icons

- Select one of the pictures from the gallery options and using your finger, place it anywhere on the screen.



Figure 8: Selecting images for your child to distinguish from the background

- Take the iPad and the data sheet, sit down at a table with your child, and write down the date and time in the third column of your data sheet. Ask, “Where is the picture?” or say, “Point to the picture.” You should wait 5 seconds and if your child touched the picture during that time, put a plus (+) on the data sheet under the date column for that trial in the box corresponding to opportunity number 1, and if he didn’t touch the picture, put a minus (-). If your child first touches the background instead of the picture, then score a (-).
- Then, turn away from your child, shake the iPad to clear the screen, and put another picture at another location of the screen. Each picture should be at a different location. Repeat the step above of asking your child where the picture is or to point at the picture.



Figure 9: Selecting the next picture for your child to distinguish from the background.

- Repeat these steps for 10 different pictures in different locations and mark your child’s performance.
- If your child can touch the picture on at least 8 of the 10 trials, then you can assume that your child already has this skill. If he or she does not have this skill, you can teach it following the steps in Boxes 1 and 2.
- Find a reinforcer (reward) that your child likes, such as a snack or a toy. Sit down with your child once or twice each day to do this activity.

- After you tell your child to “point to the picture”, you should try to predict what your child will do. This is important because you should prevent your child from making errors by gently guiding her hand to where the picture is, without letting her make an error.
- If you had to help your child to find the picture, do not give her the toy/snack reward, but give an enthusiastic praise “I like how you found that picture!”
- When your child finds the picture, give her the toy/snack reward that she likes.
- Continue these steps and recording your child’s performance until he or she can have at least 8 correct responses.

Skill 2: Matching identical objects

(Adapted from McClannahan & Krantz, 2010)

- Because it is easier for children with autism to learn matching 3-dimensional objects before they learn to match 2-dimensional objects, begin by testing your children with real objects.
- Prepare a data sheet for the matching skill. You can write each object’s name under the task column twice in a mixed order so that the child is exposed to the same object twice within a given session in between other objects.
- Sit at a table with your child and place five different toys or objects on the table. Place five identical objects out of the child’s sight. You can hide them in your pocket or on the floor where he can’t see them.
- Pick one of the objects you are holding and place it in front of your child. Say, “Point” (he should point to the object you are holding) so that his attention is directed to the object you wish him to match. Then say, “Find”.
- On the data sheet, give your child a plus (+) if:
 - He reaches for the identical object,
 - He touches the identical object, or
 - He picks up the object that is the same with the one you showed.
- On the data sheet, give your child a minus (-) if:
 - He does not respond,
 - He responds after 5 seconds, or
 - He touches the wrong object before he reaches for or picks up the correct object.

- Continue this until you complete ten opportunities for object matching. If your child makes a correct response at least 8 of the 10 opportunities, you can assume that he is able to match identical objects. If not, using the strategies described in Boxes 1 and 2 and the procedure delineated for Skill 1, you can teach this skill to your child.

Skill 3: Associating the picture with the corresponding real object

Understanding that a picture represents a depicted object is a central skill to using photographic activity schedules.

Using paper-based methods to teach picture-object correspondence carries with it the burden of either finding identical images to the real objects or taking photographs of the real objects and then getting them printed.

Using an iPad instead is not only much more time-efficient, but also since the photograph is identical to the actual object, it is more accurate than using books that include certain images of objects which may be different than real-life counterparts of the depicted objects.

- Use your iPad to take pictures of five familiar objects using the Camera.
- Prepare a Data Sheet for the correspondence skill, numbering 5 opportunities instead of 10.
- Sit at a table with your child and place the iPad and the real objects in front of her. Open the Photos from the iPad, and model to your child what you want her to do by pointing at the picture in the iPad and saying “Point”. If your child doesn’t point to the picture, guide her hand to help her do so. This pointing will bring her attention to the picture.
- Then say, “Find” and guide your child to pick up the object that is depicted in the picture. Immediately after your child picks up the object, give her a praise of special attention, such as clapping, tossing her in the air, giving her a kiss, hug, or tickling her. Repeat this for the five objects.
- The next time you work on this activity, tell your child to “Point” and “Find”, and give 5 seconds for her to make a response.
- Give her a (+) if she can find the target object without your help in 5 seconds. Give her a (-) if:
 - She does not point within 5 seconds,
 - She does not pick up the target object, or
 - She picks up another object.
- If your child does not make a correct response on at least 3 of the 5 tasks, you should use these photographs to teach picture-object correspondence to your child.

- Go back to the first step of pointing to the picture in the iPad and guide your child to point to it. Then pick up the corresponding object and give your child enthusiastic praise and attention so that she can understand that this is a behavior that is desired and will be rewarded.
- When your child finds the corresponding objects with no help from you, give her a snack or a toy that she enjoys as well as giving her praise and attention.
- When your child correctly matches all the pictures with their real counterparts, take pictures of different objects. Measure your child's responses when you present these new photos for the first time. If she does not make the correct responses at least 3 times out of 5, continue the teaching procedure described above until she can match all the new pictures with their corresponding objects.
- You should continue taking new pictures and measuring your child's performance on them until she can correctly match the new pictures with their counterparts on the first instance you show the new pictures to her.

Skill 4: Allowing manual guidance

(Adapted from McClannahan & Krantz, 2010)

You will need to use manual guidance to teach your child to follow an activity schedule. In order to do so, your child needs to let you touch his hands, arms, and shoulders, and allow you to guide him.

Many of the children with autism are not uncomfortable when physically guided, but some scream, cry, resist or run away when they are touched. So, observe your child's reaction when you are assisting him with tasks he cannot perform by himself, such as putting shoes on or using a spoon. Does he react to your assistance? Children who feel comfortable with such guidance often accept instruction used in teaching how to follow activity schedules.

If your child reacts to manual guidance, observe which types of physical contact he enjoys. Then, try to introduce manual guidance into these activities in small amounts, and gradually increase your assistance over a period of days. If your child likes to be tickled, take his hand and guide him to tickle you before you go on to tickle him. If he enjoys piggyback rides, guide him manually to climb on a chair before you let him climb your back.

You can also make use of the toys or snacks that your child likes to help him get used to manual guidance. Guide your child's hand to pick up a snack that he likes, and then you can gradually increase the amount of manual guidance over time. For instance, you can place a toy that your child likes on a high shelf that he can't reach by himself, and then lift him up and guide his hand to reach for the toy.

By using the objects and activities your child likes to introduce more and more physical contact each time, you can help him accept manual guidance. It is also important to use manual guidance not only when you are preventing your child from making errors or correcting his mistakes, but also when you are giving rewards to your child or when you are engaging in activities he enjoys, such as throwing him in the air or rocking him in your lap.

Box 3: Why does your child engage in inappropriate behaviors?

(Compiled from *Applied Behavior Analysis for Teachers* by Alberto & Troutman, 2013).

Children with autism usually engage in inappropriate behaviors to produce a desired change in their environment, such as getting something they want or escaping from something they do not want to do. When you give your child what he wants after he engages in an inappropriate behavior, this will increase the probability that he will perform that behavior again in the future.

The function of your child's inappropriate behavior may be one of the following:

- To gain attention
- To acquire a tangible object such as an object (a snack), an activity (help with homework), or an event (going to the restroom)
- To gain sensory stimulation (flicking fingers, slapping themselves, rocking their bodies to provide themselves with sensory stimulation)
- To avoid attention or interactions
- To avoid tasks
- To avoid painful or uncomfortable internal stimulation

You should teach your child a more appropriate form of behavior that has the same communicative purpose as the inappropriate behavior. Instead of rewarding your child by giving him what he is trying to acquire with his inappropriate behaviors, start rewarding him when he uses the more appropriate form of asking for something he needs.

Preparing an Activity Schedule on the iPad

Before explaining how to prepare an activity schedule for your child, let's remember the benefits of using an activity schedule for individuals with autism:

- ✓ Photographs are an effective way of teaching individuals with autism to perform and complete daily living tasks, such as getting dressed.

- ✓ Activity schedules teach individuals to transition from one activity to another activity and to make choices, areas in which individuals with autism have difficulty.
- ✓ Activity schedules increase children's independence and their opportunities to engage in social communication.
- ✓ Activity schedules teach individuals with autism to stay on-task and on-schedule (Bryan & Gast, 2000).

Moreover, preliminary studies with activity schedules on computers show that using technology can result in new types of learning through sounds, videos, dialogues, images, and instructional phrases (Stromer et al., 2006).

Step 1: Selecting activities for the first activity schedule

For your child's first activity schedule, experts (Higbee & Reagon, 2005; McClannahan & Krantz, 2010) recommend that you:

- ✓ Use familiar activities
- ✓ Make the schedule short (4-5 activities)
- ✓ Choose activities that have clear beginning and ending times (e.g. a puzzle is finished when all the pieces are in the correct place)
- ✓ Put at least one social interaction activity
- ✓ End the schedule with a snack or a game your child likes – do not make this snack or game available at other times, save it for when your child follows his activity schedule

Let's say you chose the following activities: puzzle, coloring, picture book, requesting a toss in the air, favorite snack.

Other activities to choose from: color matching, music or books on tape, stacking cups, going over the lines in a notebook, aligning letters and numbers on a magnetic surface, requesting to be tickled, and playing with legos.

Application suggestion: Princess Pea. It is a storybook that the child can read by herself or listen to it be narrated. You can turn the text on and off (Figure 10). At any point during the game, you can click on the upper right corner to play games about the story such as painting, puzzle, counting, and memory match (Figure 11). The level of the games and the story is appropriate for children with autism.



Figure 10: A page from the story in the Princess Pea application. The arrow on the top left turns the text of the story on and off. The circle on the top right gives the options for the games.



Figure 11: Options for the games in the Princess Pea application

Step 2: Preparing the activity schedule on iPad

You can use the following applications to create activity schedules on iPads: Visual Cue, Story Creator, and Keynote. First, we explain how to use the Visual Cue application in detail because it is easy to use and appropriate for a first schedule.

1. Go to App Store on your iPad and type Visual Cue in the search box.
2. You can purchase the Visual Cue application or download the Visual Cue Lite for free.
3. Click on the box that says FREE next to Visual Cue and then click again when it says INSTALL APP and type your apple ID and password.
4. When it is installed, the box will say OPEN, and you can click on it to start the application.
5. Go to the Homepage of the application and choose Visual Scheduler on the top right corner.

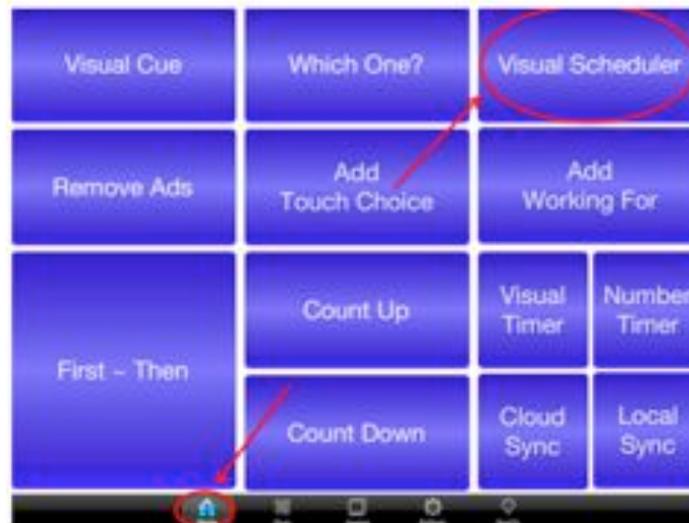


Figure 12: Selecting the Visual Scheduler in the Visual Cue application

6. Click on the folder icon next to the Typical Schedule heading.



Figure 13: Creating your first activity schedule

7. On the next screen, in the slot where it says Name, click on the white bar that contains the phrase Typical Schedule and it will let you edit the name of the schedule. Name it First Schedule or the name of your child or anything else you desire.
8. You have completed the first step of creating your schedule – giving it a name! Now, exit the application and select the Camera application of your iPad to take pictures of the activities you will put in your schedule.
9. When you are taking pictures of your activities, remember to take pictures against a plain background and arrange the objects to show how they are used.
10. The first activity we chose is a puzzle, and this application includes a picture of a puzzle that you can use. Or you can take a picture of the real puzzle you are going to use with your child.

An advantage of using an iPad is that you can download a puzzle application to your iPad and put the icon for that in your activity schedule. A good application to use is FarmPuzzle because it offers puzzles with different numbers of pieces and has hints, which are very important in the education of children with autism.

Your child can place the puzzle pieces on an empty background, or if she needs help, you can hit on the duck on the lower left and the outlines of the puzzle pieces will appear. If your child needs one more hint, you can hit the duck again and it will display a faded version of the pieces on the background so that your child can match the puzzle pieces with them.

When your child places a piece in its correct location, there is a visual reward of stars and an audio reward, which reinforces the child's correct behavior. When your child is able complete the puzzle, there is a reward of colorful bubbles. Hints and rewards are an important part of teaching individuals with autism, and this application includes them in a way that is compatible with Applied Behavioral Analysis principles.

If you are going to use this puzzle application for your activity schedule, go to the Application Store, search for Farm Puzzle (it is listed under Amazing Farm Animal Jigsaw Puzzle For Kids And Toddlers), and download the application. Then, while still in the Application Store, click on its icon to enlarge it (Figure 14), and take a screenshot to use in your activity schedule. You can take a screenshot by pressing the middle button of the iPad and the on/off button at the top at the same time (Figure 15).



Figure 14: Enlarging the application in the application store to take a screenshot of its icon to use in the activity schedule



Figure 15: Taking a screenshot with the iPad

Then, go to Gallery, select the screenshot you just took, press Edit on the top right, then press Crop on the lower right, then use your fingers on the screen to enlarge the picture and center it in the crop square, and hit Crop on the top right, then hit Save on the top right.



Figure 16: Cropping and saving a section of a screenshot



Figure 17: The icon of the application to be used in the activity schedule

11. The second activity is coloring. Using the camera of the iPad, take a picture of a few colored crayons against a plain background.
12. The third activity is looking at a picture book. Using the camera of the iPad, take a photograph of the picture book you are going to use.
13. The fourth activity is requesting a toss in the air. Ask a third person to use the iPad's camera to take a picture of you tossing your child in the air.
14. The activity schedule ends with a favorite snack of your child, so take a picture of that with the iPad.
15. Go to Homepage of the Visual Cue application. Select the Images icon on the lower bar.

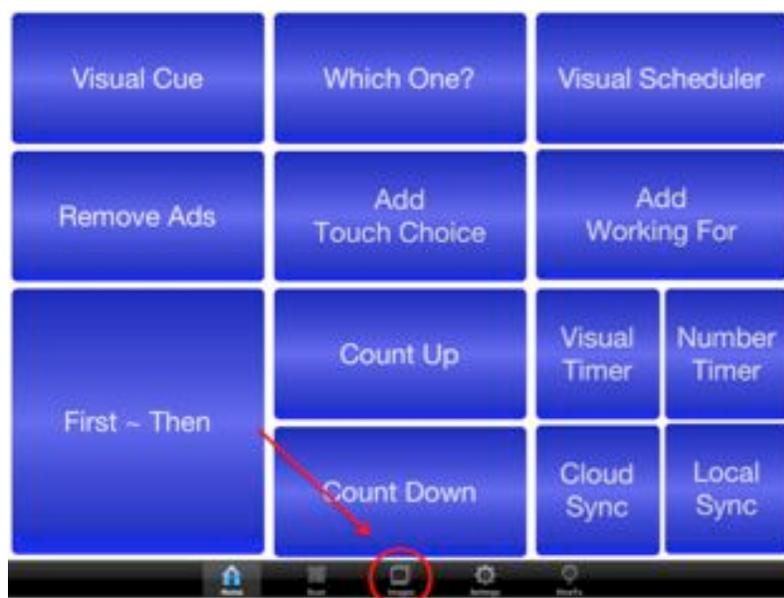


Figure 18: Selecting the Images icon on the Home screen

16. In the Image Library, select the Edit button on the top left, and at the very end of the list, select Add New Item and click Done on the top left.
17. Click on the New Image heading on the bottom of the list. On the next screen, click on the Camera icon on the top right. Select From Photo Library. It will ask for access to your library, allow it.
18. Select the camera roll and choose the picture of the activity you want to put in your activity schedule. Our first activity is puzzle, so we will select the icon of the puzzle application in the iPad.

19. Perform the same steps for each of the activities you chose and add them to the images library of this application. You can also add images that you have on your computer by connecting your iPad to your computer and dragging those images to the iTunes folder of your iPad, and they will appear on the iPad's image gallery.
20. While you are adding the pictures in the Images library of the application, you can also add recordings on those images that tell what the activity is. After you import your picture, press the Record button on the lower left, and you can record your voice saying, "puzzle" with the puzzle image. When your child hits the puzzle picture on the activity schedule, this recording will be played.
21. Then, go back to the Home screen of the application, and select Visual Scheduler. Select the First Schedule you have created by hitting on the Folder icon next to it. Then, hit Edit on the top left. Select Add New Item on the bottom of the list and add the images of the activities you have put in the library in the order you want your child to perform them.
22. By clicking on the red icons next to the images, you can remove them from your schedule. You can do so for the preexisting pictures in the application.

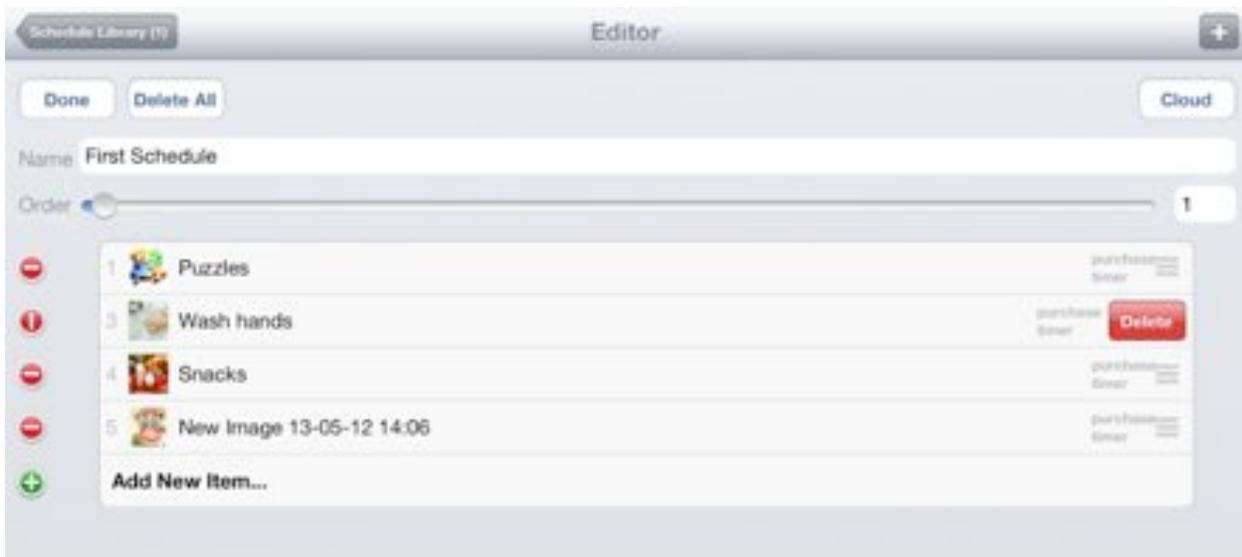


Figure 19: Adding and removing images to be used on your activity schedule

23. Now your First Schedule is ready! Go to the homepage of the Visual Cue application, select Visual Scheduler, and use the arrows on the bottom to go back to the first page. Practice using this schedule before you present it to your child. You can move to the next activity by sliding the screen. When you hit on the image with a recording, it will play the sound you associated with it.

Box 4: Going from pictures to words on the activity schedule
(Adapted from McClannahan & Krantz, 2010)

- After your child acquires basic reading skills, you can add words to the photographs in your activity schedule.
- By slowly fading or shrinking the images, you can gradually move your child to a schedule where the activities are only depicted by words.

24. After your child is able to follow this activity schedule, if you want to add words to the images, you can do so from your computer and transfer it to your iPad. You can find an image from the internet or your camera, put it in Powerpoint, add a text under it, and either save it as an image or take a screenshot on Apple products by pressing Shift and Command and 4 at the same time.

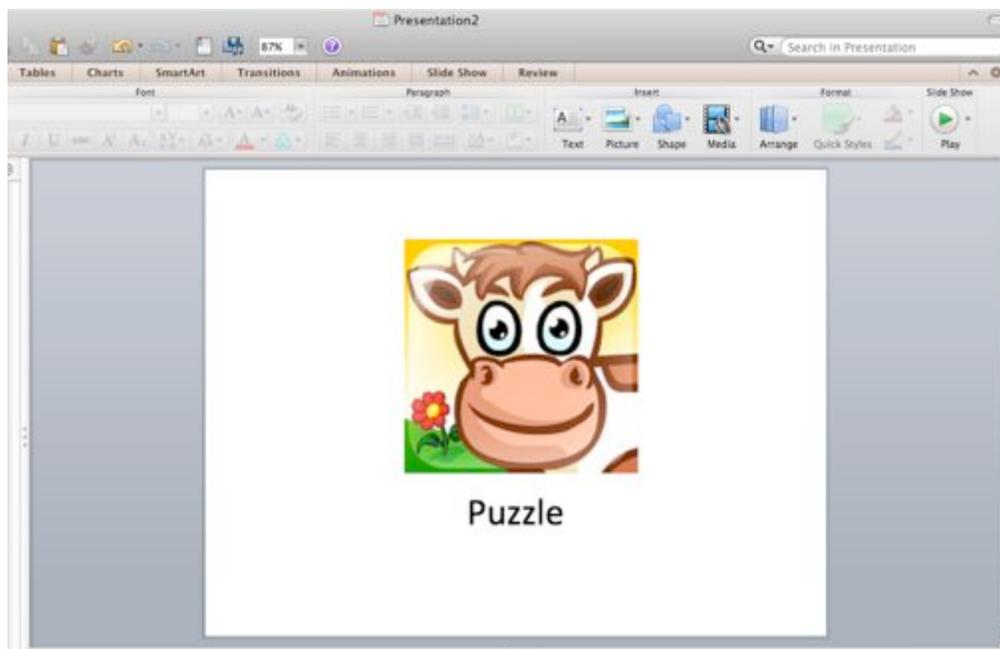


Figure 18: Creating images with texts on PowerPoint



Puzzle

Figure 19: Image with text for the more advanced activity schedule

After your child masters the activity schedule with both photographs and images, you can decrease the size of the image or fade it to make the word more prominent, and gradually transition into only using words in the activity schedule.

Using the Story Creator Application

After you teach your child how to follow activity schedules using the Visual Cue application, and you see that your child is comfortable with following it on her own, you can create a schedule for her with the Story Creator application. Story Creator allows you to add texts and videos as well as pictures and recordings. When you wish to put the names of the activities alongside with the photographs to make your child familiar with certain words, you can create your schedule in this application instead of creating image and word pairings on PowerPoint.

Install Story Creator from the Application Store. When you open the application, press on the Plus sign on the bottom and select Add Story. Using the box that appears on the screen, name your book First Schedule. Then, hit on the book to start filling its pages.

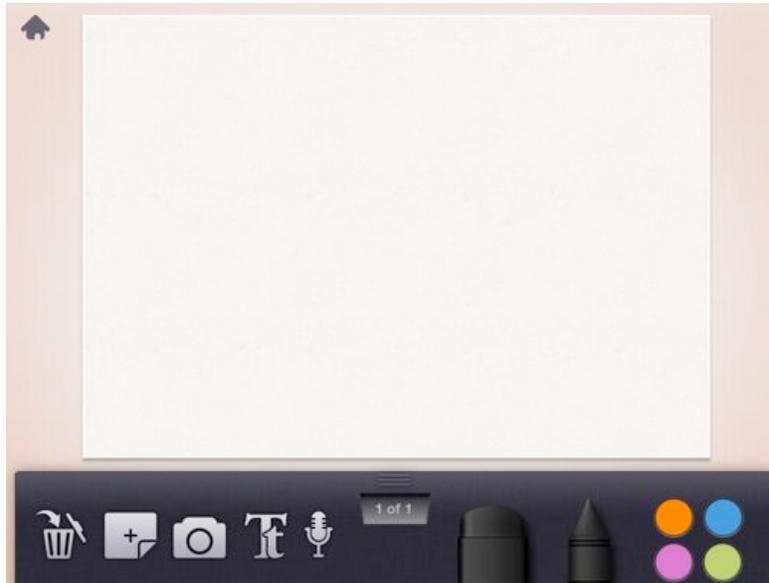


Figure 20: Creating pages in the Story Creator application

Hit the Camera icon on the toolbar to insert a picture. You can also insert a video. Hit the Tt icon to insert text. Hit the Microphone icon to insert a recording. After you record, you can select how the recording corresponds to the word because the application will highlight each pronounced word as it is spoken in the schedule. You can add pages using the Page icon with a + in its center. You can use the Trashcan icon to delete any pages you wish.

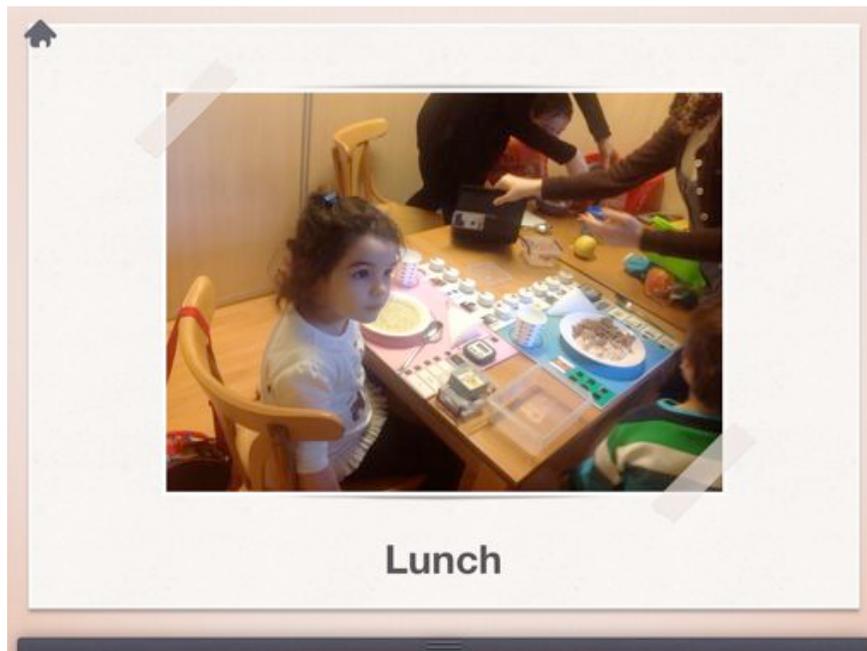


Figure 21: Sample page from a schedule in Story Creator

Note: You can also use the Keynote application to create activity schedules. It is not free like the Visual Cue and the Story Creator applications, but you may purchase it. The steps to create an activity schedule are similar to the ones described above.

How to Teach Your Child to Follow Activity Schedules on the iPad

Use the skills explained in Box 2 to teach your child how to follow his or her first activity schedule.

Box 2: How to Teach a Skill using ABA Principles

These are the fundamental steps of teaching a skill to your child using principles of Applied Behavioral Analysis. Following these steps will help you when teaching any skill to your child, so we advise you to get a print out of it and refer to it whenever you need.

- Determine target skill
- Break down the skill into simple steps
- Ask the child to perform the intended skill
- If child doesn't perform what is asked, direct her to the correct response using prompts
- If correct response is not given, manually guide the child to perform the correct response and try to prevent the child from engaging in an incorrect response
- Reinforce (give a reward) immediately after the correct response
- Repeat these steps
- Fade the prompts and lessen the reinforcements as the child performs better, start giving reinforcements for the correct completion of more complex behaviors

1. Give your child an instruction so that he knows what he is expected to do, such as "Follow your activity schedule" or "Go to your schedule".
2. After you give this instruction, direct your child to the activity schedule by manual guidance. Hold his shoulders or arms and lead him to the iPad.
3. By placing your hand over his, make him point at the first activity on the iPad.

4. Then, help him go and pick up the material depicted in the picture, or help him exit the schedule application and enter the application the image of which is depicted in the schedule, such as the puzzle application.
5. Next, help your child complete the activity. You should only give guidance to prevent errors.
6. When the activity is finished, guide him to pick up the materials and put them back.
7. Then, guide your child to the iPad, help him slide the page to the next one. If there is a recording, put your hand on top of his and tap onto the picture to listen to the recording.
8. Perform the same steps as the first activity.

For each activity in the schedule, you should help your child:

- Open the activity schedule or go to the next page,
- Point to the image,
- Get the materials depicted in the image and bring them to the work area,
- Complete the activity,
- Put the materials back,
- Go back to the schedule and go to the next page (McClannahan & Krantz, 2010).

➔ You should remember not to talk to your child after giving him the initial instruction. This is important to help your child achieve independence from external instructions.

Rewards

You should deliver rewards frequently when you start to teach your child how to follow activity schedules. When you are giving snack foods as rewards, stand behind your child and reach around and deliver the food in his mouth. The purpose of standing behind your child is to stay out of his sight so that he can associate the correct action he performs with the reward he receives and not with the person who is delivering the reward. Give the rewards right after the appropriate behavior so that the child makes the connection between his behavior and the reward, and becomes more likely to repeat such behavior in the future. Do not reward your child when he makes an error, is very slow, resists manual guidance, or engages in stereotypical or tantrum behaviors (McClannahan & Krantz, 2010).

Start by giving rewards frequently. After your child becomes able to complete certain steps of schedule following, start rewarding him for more complex behaviors. You should start by closely following your child behind him so that you can intervene before he makes any mistakes because it is very difficult to erase an erroneous behavior once it is learned. When you feel like your child is able to perform a certain behavior by himself, you can move away from him.

Data Collection

You should keep track of your child’s learning by collecting data at the end of every week or every two weeks. You should give your child the instruction and no guidance, and record his performance on data sheets, examples of which are given below.

	Drags the screen	Looks at/ points to the prompt	Brings materials to the table	Completes the activity	Puts back the materials	Goes back to the iPad schedule
1 st activity						
2 nd activity						
3 rd activity						
4 th activity						
5 th activity						

	Drags the page	Touches and listens to the pronunciation	Follows the writing on the screen with finger	Points at the writing on the activity box	Grabs the material	Completes the activity	Puts the material back	Returns to the schedule in the iPad
1 st activity								
2 nd activity								
3 rd activity								
4 th activity								
5 th activity								

Table 2: Examples of data collection sheets for following activity schedules on iPads. Courtesy of Tohum School for Autism.

Give a (+) when he was able to complete the required step, and a (–) when he wasn’t or when he needed manual guidance. Your filled sheet will look like this:

Sayfayı sürükler	Dokunur sesi dinler	Yazıya dokunmadan bakar / gösterir	Etkinlik kutusundaki bas konuşa basar	Yazıyı işaret eder	Materyali alır	Etkinliği tamamlar	Materyali yerine koyar	İpad'e yönelir
+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+

5/5
%91

Figure 22: Filled data collection form. Courtesy of Tohum School for Autism.

Next, add up the total number of pluses and the total number of trials, and divide the first by the latter, and multiply by 100 to get a percentile performance score for your child. Then, get a graphing paper and on the x-axis, put the dates, and on the y-axis, mark it from 0 to 100 for the scores. Every time you take your scores, record it on this graphing paper to observe the improvement in your child (Figure 23).

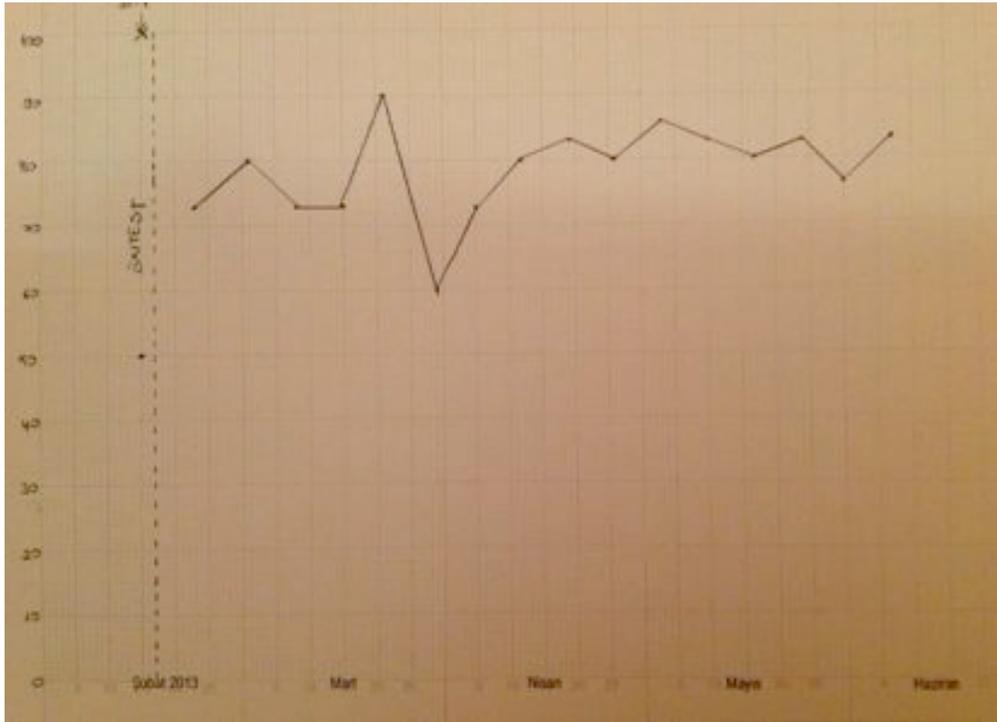


Figure 23: Preparing a graph of your child's performance data. Courtesy of Tohum School for Autism.

When your child is able to score 80 to 100% in several consecutive sessions without your help, you can change the contents of the activity schedule and include more advanced activities. You can also gradually get rid of the images and just use words to help your child acquire basic vocabulary through matching the word with the object or activity it represents (Figure 24). You can start by writing the words in big fonts to make them easier to read, and as your child

successfully learns to match those words, you can decrease the size of the words to prepare him to read words in the size they are used daily in books and newspapers (Figure 25).



Figure 24: Fading out the image and moving on to just using words in an activity schedule

Figure 25: Gradually decreasing the size of the words



NOTE: Remember that the purpose of this teaching is to enable your child to continuously interact with the activity schedule on the iPad without any instruction from you, only through the guidance of the iPad. So, you should start by manually guiding your child to follow the iPad without speaking to him, then reward him frequently for every small step he performs correctly, then start rewarding him less frequently until following the iPad schedule by himself becomes a habit for your child.

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