

Module: Self-Management

Evidence-Based Practice Brief: Self-Management

This evidence-based practice brief on self-management includes the following components:

1. **Overview, which gives a quick summary of salient features of the practice, including what it is, who it can be used with, what skills it has been used with, settings for instruction, and additional literature documenting its use in practice**
2. **Steps for Implementation, detailing how to implement the practice in a practitioner-friendly, step-by-step process**
3. **Implementation Checklist, to be used to monitor fidelity of the use of the practice**
4. **Evidence Base Summary, which details the NPDC-ASD criteria for inclusion as an evidence-based practice and the specific studies that meet the criteria for this practice**
5. **Self-management data collection sheets**

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Overview of Self-Management

Neitzel, J. & Busick, M. (2009). *Overview of self-management*. Chapel Hill, NC: National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.

Self-management interventions help learners with autism spectrum disorders (ASD) learn to independently regulate their own behaviors and act appropriately in a variety of home, school, and community-based situations. With these interventions, learners with ASD are taught to discriminate between appropriate and inappropriate behaviors, accurately monitor and record their own behaviors, and reward themselves for behaving appropriately. As learners with ASD become more fluent with the self-management system, some of the implementation responsibilities shift from teachers, families, and other practitioners to the learners themselves.

Evidence

Self-management meets criteria for being an evidence-based practice within the early childhood elementary, middle, and high school age groups. This practice can be used to promote the development of play, social, adaptive, behavior, and language/communication skills.

With what ages is self-management effective?

Self-management interventions can be used across the age range starting in early childhood through high school to help learners with ASD acquire key skills needed to interact with others, initiate and maintain conversations, develop self-help skills, and reduce interfering behaviors (e.g., stereotypic, disruptive behaviors).

What skills or intervention goals can be addressed by self-management?

Self-management interventions can be used to reduce inappropriate and interfering behaviors (disruptive behaviors, not completing school work and chores independently and efficiently, etc.) and to increase social, adaptive, and language/communication skills. Specific skills that were the focus of interventions in the evidence-based studies include giving compliments to others, responding to others, sharing, increasing on-task behavior, initiating interactions, reducing the occurrence of interfering behaviors, promoting daily living skills, increasing play skills, and conversing with others.

In what settings can self-management be effectively used?

Self-management interventions have been used effectively in clinical and school-based settings across preschool and high school age groups.

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Evidence Base

The studies cited in this section provide the basis upon which this practice was determined to meet the NPDC on ASD's criteria as an evidence-based practice. This list is not exhaustive; other quality studies may exist that were not included.

Preschool

Apple, A. L., Billingsley, F., & Schwartz, I. S. (2005). Effects of video modeling alone and with self-management on compliment-giving behaviors of children with high-functioning ASD. *Journal of Positive Behavior Interventions, 7*, 33-46.

Newman, B., Tuntigian, L., Ryan, C. S., & Reinecke, D. R. (1997). Self-management of a DRO procedure by three students with autism. *Behavioral Interventions, 12*, 149-156.

Reinecke, D. R., Newman, B., & Meinberg, D. L. (1999). Self-management of sharing in three pre-schoolers with autism. *Education and Training in Mental Retardation and Developmental Disabilities, 34*, 312-317.

Elementary School Age

Coyle, C., & Cole, P. (2004). A videotaped self-modeling and self-monitoring treatment program to decrease off-task behaviour in children with autism. *Journal of Intellectual and Developmental Disability, 29*, 3-16.

Kern, L., Marder, T. J., Boyajian, A. E., Elliot, C.M., & McElhattan, D. (1997). Augmenting the independence of self-management procedures by teaching self-initiation across settings and activities. *School Psychology Quarterly, 12*, 23-32.

Koegel, R. L., & Koegel, L. K. (1990). Extended reductions in stereotypic behavior of students with autism through a self-management treatment package. *Journal of Applied Behavior Analysis, 23*, 119-127.

Koegel, L. K., Koegel, R. L., Hurley, C., & Frea, W. D. (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis, 25*, 341-353.

Newman, B., Reinecke, D. R., & Meinberg, D. L. (2000). Self-management of varied responding in three students with autism. *Behavioral Interventions, 15*, 145-151.

Pierce, K. L., & Schreibman, L. (1994). Teaching daily living skills to children with autism in unsupervised settings through pictorial self-management. *Journal of Applied Behavior Analysis, 27*, 471-481.

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Stahmer, A. C., & Schreibman, L. (1992). Teaching children with autism appropriate play in unsupervised environments using a self-management treatment package. *Journal of Applied Behavior Analysis, 25*, 447-459.

Middle School

Koegel, L. K., Koegel, R. L., Hurley, C., & Frea, W. D. (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis, 25*, 341-353.

Koegel, R. L., & Frea, W. D. (1993). Treatment of social behavior in autism through the modification of pivotal social skills. *Journal of Applied Behavior Analysis, 26*, 369-377.

Koegel, R. L., & Koegel, L. K. (1990). Extended reductions in stereotypic behavior of students with autism through a self-management treatment package. *Journal of Applied Behavior Analysis, 23*, 119-127.

Mancina, C., Tankersley, M., Kamps, D., Kravits, T., & Parrett, J. (2000). Reduction of inappropriate vocalizations for a child with autism using a self-management treatment program. *Journal of Autism and Developmental Disorders, 30*, 599-606.

Stahmer, A. C., & Schreibman, L. (1992). Teaching children with autism appropriate play in unsupervised environments using a self-management treatment package. *Journal of Applied Behavior Analysis, 25*, 447-459.

High School

Kern, L., Marder, T. J., Boyajian, A. E., Elliot, C. M., & McElhattan, D. (1997). Augmenting the independence of self-management procedures by teaching self-initiation across settings and activities. *School Psychology Quarterly, 12*, 23-32.

Koegel, R. L., & Frea, W. D. (1993). Treatment of social behavior in autism through the modification of pivotal social skills. *Journal of Applied Behavior Analysis, 26*, 369-377.

Newman, B., Buffington, D. M., & Hemmes, N. S. (1996). Self-reinforcement used to increase the appropriate conversation of autistic teenagers. *Education and Training in Mental Retardation and Developmental Disabilities, 31*, 304-309.

Newman, B., Buffington, D. M., O'Grady, M. A., McDonald, M. E., Poulson, C. L., & Hemmes, N. S. (1995). Self-management of schedule following in three teenagers with autism. *Behavioral Disorders, 20*, 190-196.

Selected Additional References

Mithaug, D. K., & Mithaug, D. E. (2003). Effects of teacher-directed versus student-directed instruction on self-management of young children with disabilities. *Journal of Applied Behavior Analysis, 36*, 133-136.

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Newman, B., Tuntigian, L., Ryan, C. S. & Reinecke, D. R. (1997). Self-management of a DRO procedure by three students with autism. *Behavioral Interventions*, 12, 149-156.

Shearer, D. D., Kohler, F. W., Buchan, K. A., & McCullough, K. M. (1996). Promoting independent interactions between preschoolers with autism and their nondisabled peers: an analysis of self-monitoring. *Early Education and Development*, 7, 205-220.

Todd, R., & Reid, G. (2006). Increasing physical activity in individuals with autism. *Focus on Autism and Other Developmental Disabilities*, 21, 167-176.

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Evidence Base for Self-Management

The National Professional Development Center on ASD has adopted the following definition of evidence-based practices.

To be considered an evidence-based practice for individuals with ASD, efficacy must be established through peer-reviewed research in scientific journals using:

- *randomized or quasi-experimental design studies*. Two high quality experimental or quasi-experimental group design studies,
- *single-subject design studies*. Three different investigators or research groups must have conducted five high quality single subject design studies, or
- *combination of evidence*. One high quality randomized or quasi-experimental group design study and three high quality single subject design studies conducted by at least three different investigators or research groups (across the group and single subject design studies).

High quality randomized or quasi-experimental design studies do not have critical design flaws that create confounds to the studies, and design features allow readers/consumers to rule out competing hypotheses for study findings. High quality in single subject design studies is reflected by a) the absence of critical design flaws that create confounds and b) the demonstration of experimental control at least three times in each study.

This definition and criteria are based on the following sources:

Horner, R., Carr, E., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single subject research to identify evidence-based practice in special education. *Exceptional Children, 71*, 165-180.

Nathan, P., & Gorman, J. M. (2002). *A guide to treatments that work*. NY: Oxford University Press.

Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. D., Thompson, B., & Harris, K. (2004). *Quality indicators for research in special education and guidelines for evidence-based practices: Executive summary*. Arlington, VA: Council for Exceptional Children Division for Research.

Rogers, S. J., & Vismara, L. A. (2008). Evidence based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology, 37*(1), 8-38.

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Using these criteria, the empirical studies referenced below provide documentation for supporting self-management as an evidence-based practice.

Preschool

Apple, A. L., Billingsley, F., & Schwartz, I. S. (2005). Effects of video modeling alone and with self-management on compliment-giving behaviors of children with high-functioning ASD. *Journal of Positive Behavior Interventions*, 7, 33-46.

Newman, B., Reinecke, D. R., & Meinberg, D. L. (2000). Self-management of varied responding in three students with autism. *Behavioral Interventions*, 15, 145-151.

Reinecke, D. R., Newman, B., & Meinberg, D. L. (1999). Self-management of sharing in three pre-schoolers with autism. *Education and Training in Mental Retardation and Developmental Disabilities*, 34, 312-317.

Elementary School

Coyle, C., & Cole, P. (2004). A videotaped self-modeling and self-monitoring treatment program to decrease off-task behaviour in children with autism. *Journal of Intellectual and Developmental Disability*, 29, 3-16.

Kern, L., Marder, T. J., Boyajian, A. E., Elliot, C.M., & McElhattan, D. (1997). Augmenting the independence of self-management procedures by teaching self-initiation across settings and activities. *School Psychology Quarterly*, 12, 23-32.

Koegel, R. L., & Koegel, L. K. (1990). Extended reductions in stereotypic behavior of students with autism through a self-management treatment package. *Journal of Applied Behavior Analysis*, 23, 119-127.

Koegel, L. K., Koegel, R. L., Hurley, C., & Frea, W. D. (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis*, 25, 341-353.

Newman, B., Reinecke, D. R., & Meinberg, D. L. (2000). Self-management of varied responding in three students with autism. *Behavioral Interventions*, 15, 145-151.

Pierce, K. L., & Schreibman, L. (1994). Teaching daily living skills to children with autism in unsupervised settings through pictorial self-management. *Journal of Applied Behavior Analysis*, 27, 471-481.

Stahmer, A. C., & Schreibman, L. (1992). Teaching children with autism appropriate play in unsupervised environments using a self-management treatment package. *Journal of Applied Behavior Analysis*, 25, 447-459.

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- Koegel, L. K., Koegel, R. L., Hurley, C., & Frea, W. D. (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis, 25*, 341-353.
- Koegel, R. L., & Frea, W. D. (1993). Treatment of social behavior in autism through the modification of pivotal social skills. *Journal of Applied Behavior Analysis, 26*, 369-377.
- Koegel, R. L., & Koegel, L. K. (1990). Extended reductions in stereotypic behavior of students with autism through a self-management treatment package. *Journal of Applied Behavior Analysis, 23*, 119-127.
- Mancina, C., Tankersley, M., Kamps, D., Kravits, T., & Parrett, J. (2000). Reduction of inappropriate vocalizations for a child with autism using a self-management treatment program. *Journal of Autism and Developmental Disorders, 30*, 599-606.
- Stahmer, A. C., & Schreibman, L. (1992). Teaching children with autism appropriate play in unsupervised environments using a self-management treatment package. *Journal of Applied Behavior Analysis, 25*, 447-459.

High School

- Kern, L., Marder, T. J., Boyajian, A. E., Elliot, C. M., & McElhattan, D. (1997). Augmenting the independence of self-management procedures by teaching self-initiation across settings and activities. *School Psychology Quarterly, 12*, 23-32.
- Koegel, R. L., & Frea, W. D. (1993). Treatment of social behavior in autism through the modification of pivotal social skills. *Journal of Applied Behavior Analysis, 26*, 369-377.
- Newman, B., Buffington, D. M., & Hemmes, N. S. (1996). Self-reinforcement used to increase the appropriate conversation of autistic teenagers. *Education and Training in Mental Retardation and Developmental Disabilities, 31*, 304-309.
- Newman, B., Buffington, D. M., O'Grady, M. A., McDonald, M. E., Poulson, C. L., & Hemmes, N. S. (1995). Self-management of schedule following in three teenagers with autism. *Behavioral Disorders, 20*, 190-196.

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Self-Management: Steps for Implementation

Busick, M., & Neitzel, J. (2009). *Self-management: Steps for implementation*. Chapel Hill, NC: National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.

Self-management systems can be used to increase desired behaviors and/or decrease interfering behaviors of individuals with ASDs by teaching them how to: (a) monitor their own behavior, (b) record their performance, and (c) obtain reinforcement when their performance meets a pre-established behavior criterion. The steps of implementing a self-management system include: (1) preparing the specific system to be implemented, (2) teaching the learner to use the system, (3) implementing the system with adult support, and (4) promoting learner independence with the system.

Step 1. Preparing the Self-Management System

Before implementing a self-management system, a collaborative team engages in several activities to ensure the system will be implemented effectively and efficiently. Members of this team might include teachers, parents, specialists, and any other individual who provides services or spends a significant amount of time with the learner in the setting where the intervention will be implemented.

1. To prepare the self-management system, Teachers/practitioners and other collaborative team members engage in the following activities:
 - a. identifying the **target behavior** to increase or decrease and
 - b. developing a clear description of the target behavior that adults agree upon and is presented in a format that learners are able to comprehend.

The target behavior must be clearly defined so that Teachers/practitioners can easily observe and measure the difference between the occurrence and non-occurrence of the behavior. A clearly defined target behavior also helps learners make these discriminations. An observable and measurable description of the behavior should include what the behavior looks like (e.g., the body parts, movements, materials involved) and the setting(s) or context(s) in which it occurs/is expected to occur. If more than one adult will be observing the learner, the description must be clear enough so that all team members who work with the learner with ASD in the intervention setting agree on when the behavior occurs and when it does not. The description developed for the learner may be identical to the description the team uses, or it may be simplified to make it more comprehensible to the learner. For example, for a younger or less verbal learner, a pictorial depiction of the behavior description may be developed. For a learner who can read, the description of the target behavior can be written in language the learner understands. Such pictorial or written versions of the behavior can then be used as reminders to learners as they use the self-management system (e.g., taped to the learners' desk, made small enough to carry in their pocket and refer to as needed).

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Before implementing a self-management system with interfering behaviors (i.e., behaviors that the team desires to decrease), the team should first conduct a **functional behavioral assessment (FBA)**. The FBA process provides insightful information toward developing the self-management system including (a) the function(s) of the interfering behavior, (b) potential replacement behaviors, and (c) potential reinforcers related to the function of the behavior being targeted in the self-management system. **Please refer to *Functional Behavior Assessment: Steps for Implementation* (National Professional Development Center on ASD, 2008) for more information about FBA.**

2. Teachers/practitioners identify reinforcers that reward the learner by:
 - a. asking family members,
 - b. asking or formally assessing the learner, and
 - c. using knowledge about the learner.

It is best to identify a variety of **reinforcers** for the learner to use as opposed to a single reinforcer so that learners do not become dependent upon a particular type of reinforcement. Reinforcers can be identified in a number of ways. First, caregivers (e.g., child care providers, parents) who are familiar with the learner can identify toys, edibles, activities, and/or materials that the learner prefers. Learners also may identify reinforcers that they are likely to be motivated to earn. Learner input can be obtained informally (e.g., by asking the learners what they would like to earn) or more formally through preference assessments). **Please refer to *Positive Reinforcement: Steps for Implementation* (National Professional Development Center on ASD, 2008) for more information about reinforcement.**

When possible, it is best to use natural reinforcers, that is, reinforcers that are logically related to the target behavior. For example, if the target behavior is to remain seated during circle time (a non-preferred activity), a logical reinforcer would be a break from circle time. If the target behavior is to raise one's hand to get the teacher's attention, the natural reinforcer is actually obtaining the teacher's attention. Sometimes, natural reinforcers alone are not strong enough and must be supplemented with artificial reinforcers, especially during the initial teaching stages. However, natural reinforcers are best at maintaining behavior in the long run because they will remain in place when those artificial reinforcers are faded out.

3. Teachers/practitioners develop a data collection system by identifying:
 - a. *the type of data collection system* (interval or frequency) and
 - b. *the initial criterion for the target behavior*. The **initial criterion** for the target behavior should be based on a learner's performance before the intervention begins and should be set low enough to increase the likelihood that the learner will successfully use the target skill.

There are two types of self-management systems. One is focused on the duration (**interval system**) and the other with the frequency (**frequency system**) of the behavior. Both of these systems are explained further in the sections that follow.

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Interval systems. A criterion using an interval system (i.e., the learner must/must not demonstrate the behavior for X number of Y-second intervals) is appropriate in cases where one desires to increase the **duration** that a desired behavior occurs (e.g., remaining in seat, staying on task, conversing with peers) or an interfering behavior does *not* occur (e.g., flapping hands, chewing shirt, hitting peers). If an interval system is used, the initial length of the **interval** should be set so that there is a high likelihood that the learner will be successful.

The best way to determine the initial length of the interval is to observe the learner before the intervention begins and determine the average length of time the learner can be successful without support from others. The initial interval length should be equal to or slightly less than that average. For example, if the goal is to increase the length of time a learner sits in his seat without getting up, and it is determined that, on average, the learner stays in his seat for one minute before getting up, then beginning the self-management system with a one-minute interval or slightly less (e.g., 45 seconds) makes sense. After the interval length is determined, the initial session length during which the self-management system will be used should be determined and divided into intervals of the pre-determined length. The initial number of intervals during which the learner must be successful also should be set.

Continuing with the sitting example, if the self-management system will initially be used for a six-minute session, and these six minutes are divided into six one-minute intervals, the initial criterion could be set such that the learner must stay sitting in his seat for three of the six (50%) one-minute intervals.

Frequency systems. When the **frequency** of a behavior needs to be increased or decreased (e.g., raising hand in class, taking bites of food, asking peers questions), a **frequency criterion** should be considered. Examples of frequency criteria for behaviors that need to be increased and decreased are provided below.

EXAMPLE #1: Frequency Criterion for Increased Behavior

The learner must demonstrate the behavior X number of times to earn the reinforcer.

EXAMPLE #2: Frequency Criterion for Decreased Behavior

The learner must demonstrate the behavior no more than X number of times in a given time period to earn the reinforcer.

If the goal is to increase a desired behavior, the **initial criterion** (i.e., the number of times the learner must demonstrate the behavior) should initially be set low enough so that the learner rapidly earns the reinforcer. For example, if the goal is to increase hand-raising in class and the learner rarely raises her hand, the initial criterion may be set at one hand-raise to earn the reinforcer.

If the goal is to decrease an interfering behavior, the initial criterion (i.e., the number of times that the learner can demonstrate the behavior in the given time period) should initially be set

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high enough so that the learner is likely to be successful. For example, if a learner with ASD hits his peers about five times on average during free play, the initial criterion may be set at five or less hits during free play to earn the reinforcer. Similar to the interval system, information obtained from observing the learner's performance before the intervention begins should guide the selection of the initial criterion.

4. Teachers/practitioners select self-monitoring recording and cueing (if interval system is used) devices that are appropriate based on learner characteristics and the setting in which the self-management system will be used.

For learners to monitor their behaviors, a **self-recording device** must be selected. Paper and pencil systems are the most common choices. If an interval system is used with paper and pencil, the intervals should be clearly delineated on the paper and it should be easy for learners to record their behaviors for each interval (e.g., checking yes or no; circling a smiley face or a frown face). With a frequency criterion, it is helpful to make it clear on the paper how many times learners must demonstrate target behaviors to earn the reinforcer (or alternatively, the maximum number of times they are allowed to demonstrate an interfering behavior). For example, if a learner must raise her hand five times to earn the reinforcer, a piece of paper with five boxes drawn with a picture depicting the behavior in each box may be used. Once she checked off all five boxes signifying that she had raised her hand five times, she would earn the reinforcer. If a learner must not snatch toys from his peers five times or less during free play time to earn the reinforcer, a piece of paper with five boxes drawn with a picture depicting him snatching the toy may be used (perhaps also with a "no" symbol to indicate to the learner that this behavior is undesirable). In this case, as long as he had at least one box left that was unchecked, he would earn the reinforcer. Sample self-recording data sheets are provided in the Resources section of the module.

Paper and pencil systems are certainly not the only option. Teachers should be creative in identifying the self-recording device so that it best fits the situation and the learner. Other examples of self-recording devices for learners include:

- using clicker devices,
- using token boards,
- moving paper clips from one pocket to another each time they demonstrate the behavior, and
- moving rubber bands from one wrist to another each time they demonstrate the behavior.

If an interval system is used, an additional device should be selected that cues the learner when each interval ends. The cueing device should prompt learners that they need to self-record their behavior. Examples of cueing devices include:

- alarm clocks,
- kitchen timers,
- stopwatches,

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- teacher tapping the learner's desk,
- wristwatches with beeping alarms, and
- wristwatches with vibrating alarms.

Another factor to consider when selecting recording and cueing devices is how intrusive and/or covert they are. This may be an especially important factor as peers get older and become more aware of things that make the learner "stand out." For example, moving paper clips from one pocket to another may be a more covert way for a learner to self-record than a paper and pencil system that remains on the learner's desk and is obvious to peers. Likewise, a wristwatch with a vibrating alarm to cue the end of the interval may draw less attention from peers than a wristwatch that has a beeping alarm.

Step 2. Teaching Learners to Use the Self-Management System

Learners should be able to demonstrate three elements of the self-management system before implementing it in the actual setting where it will be used. First, learners should demonstrate the target behaviors (or *not* demonstrate if the behaviors are targeted for reduction) and discriminate whether the target behaviors have and or have not occurred. Second, learners should be able to accurately record when they have and have not demonstrated the target behaviors. Third, learners need to manage the reinforcers.

1. Teachers/practitioners instruct learners to demonstrate the correct behavior by:
 - a. providing learners with a description of the target behavior in a comprehensible form (e.g., a simply written description, a pictorial depiction),
 - b. prompting learners to demonstrate correct behavior upon request (as needed),
 - c. reinforcing all correct demonstrations of behavior (prompted and unprompted), and
 - d. fading prompts until learners consistently and independently demonstrate correct behavior upon request.

When trying to increase a behavior, "correct" is defined as the target behavior itself. On the other hand, when trying to decrease behaviors, "correct" is defined as appropriate, alternative behaviors and/or not demonstrating the target behavior.

When learners understand target behaviors, they are able to demonstrate them on request. To evaluate learners' understanding of target behaviors, Teachers/practitioners should ask them to demonstrate target behaviors. For example, a student who throws toys instead of playing with them appropriately should be able to demonstrate both keeping the toy in his/her hands (the correct behavior) and throwing them (the incorrect behavior). Being able to demonstrate examples of correct and incorrect behaviors indicates that learners can discriminate between the two. Being able to make this discrimination is important when learners use the self-management system to self-monitor and self-record their behaviors.

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If learners are unable to demonstrate the target behaviors upon request, teachers and other practitioners provide the necessary **prompts** to help them complete the task. **Reinforcement** (e.g., verbal praise, edibles) should be provided for all prompted and unprompted demonstrations of correct behavior. Learners should practice the target behavior until they can reliably demonstrate correct behavior independently without any additional prompting.

Once learners independently demonstrate correct behavior upon request, they are taught to discriminate between the occurrences of correct behavior versus incorrect behavior. For desired behaviors, the correct behavior is demonstration of the target behavior itself whereas incorrect behavior is demonstration of any behavior other than the target behavior (i.e., any behavior that does not meet the clear, observable, and measurable description of the target behavior that was developed). For example, if the target behavior is greeting friends by name when they come join in play (a desired behavior), saying "Hello, (friend's name)" would be an example of correct behavior. Saying the wrong name or saying nothing at all when a friend joins in play would be examples of incorrect behavior. For interfering behaviors, the correct behavior is the absence of the interfering behavior (as defined by the description that was developed). The incorrect behavior, on the other hand, is any behavior that fully or partially meets the description of the interfering behavior that was developed by the team. For instance, if the target behavior is hitting and/or kicking other students while walking in line (an interfering behavior), an example of the correct behavior would be walking quietly in line with hands and feet to one's self. An example of incorrect behavior would be doing any parts (i.e., talking, hitting, or kicking) of the target behavior.

2. Teachers/practitioners instruct learners how to discriminate between correct versus incorrect behavior by :
 - a. modeling examples and non-examples of the behavior;
 - b. prompting the learner as needed to identify whether each modeled behavior is an example or a non-example;
 - c. reinforcing all correct identifications of examples and non-examples (prompted and unprompted); and
 - d. fading prompts until learners can consistently and independently identify examples and near-, but still non-examples.

The teacher begins **discrimination teaching** by modeling examples of correct and incorrect behavior and having the learner identify whether each modeled behavior is correct or incorrect. The learner is prompted as necessary to accurately identify whether a modeled behavior is correct or incorrect and then reinforced for all accurate identifications (prompted and unprompted). Initially, the differences between the examples of correct and incorrect behavior should be very obvious. As learners become more successful at identifying behaviors, the examples of correct and incorrect behavior should become more similar so that learners must make crisper discriminations. For example, if the goal is to increase hand-raising, the teacher

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might model a full hand raise as an example of correct behavior versus hands by one's side as an example of incorrect behavior.

Once the learner can independently discriminate between these two, the teacher might model a full hand raise as the correct behavior versus a half hand raise as incorrect. As another example, if the goal is to decrease hitting peers, the teacher might model keeping hands to one's self when next to a peer as an example of correct behavior versus hitting a peer on the shoulder as an example of incorrect behavior. Once the learner can independently make this discrimination, the teacher might model tapping the peer on the shoulder as an example of correct behavior versus hitting a peer on the shoulder as an example of incorrect behavior.

When learners consistently demonstrate the target behaviors and make discriminations between examples of correct and incorrect behavior, the next step is to teach them to use the recording system that was selected in Step 1.

3. Teachers/practitioners teach learners how to use self-recording systems by:
 - a. modeling examples of correct and incorrect behavior and prompting learners as needed to record accurately at the appropriate time;
 - b. reinforcing all accurate recordings at the appropriate time (prompted and unprompted); and
 - c. fading prompts until learners independently and accurately record behaviors 80% of the time.**

** This criterion was selected because it give teachers/practitioners a clear criterion for evaluating learner progress with the self-management system. Furthermore, this criterion is commonly used in the literature to determine acquisition of skills.

Learners need to be taught how to record at the appropriate time and to do so accurately. An effective strategy to teach appropriate and accurate recording is for teachers to model examples of correct and incorrect behavior for the learner (similar to the models used in Step 2a) and then assist the learner (via prompting) to record whether the modeled behavior they observed was an example of correct or incorrect behavior.

If an *interval system* is used, the appropriate time to record is when the cueing device signals the end of an interval. With an interval system, accurate recording means learners can correctly indicate whether they demonstrated correct behavior for the entire length of a given interval. For instruction, the teacher might model an example of either correct or incorrect behavior during the interval. When the cueing device signals the end of the interval, the teacher prompts the learner as necessary to record whether the modeled behavior should be counted as an example of the behavior or not. If necessary, teachers prompt learners to record their behavior at the appropriate time with accuracy.

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If a *frequency system* is used, the appropriate time to record is whenever the target behavior is demonstrated. With a frequency system, accurate recording means learners correctly indicate whenever they have demonstrated their target behaviors. For instruction, the teacher models an example of either correct or incorrect behavior. After the model is demonstrated, the teacher prompts the learner to record that a correct behavior occurred (or refrain from recording if an example of incorrect behavior was modeled).

Reinforcement should be provided for all instances (prompted and unprompted) of recording at the appropriate time as well as when responses are recorded accurately. **Prompts** should be faded until the learner can independently (i.e., without adult prompting) record behaviors at the appropriate time with at least 80% accuracy. **Please refer to *Positive Reinforcement: Steps for Implementation* (National Professional Development Center on ASD, 2008) for more information about reinforcement. Please refer to *Prompting: Steps for Implementation* (National Professional Development Center on ASD, 2008) for more information about prompting.**

Once learners are fluent at the skills taught in Step 2 (i.e., demonstrating and discriminating the target behaviors, using the recording system), it is time to implement the self-management system in the targeted setting.

Step 3. Implementing the Self-Management System

1. Teachers/practitioners:
 - a. provide learners with materials needed to use the self-management system at the appropriate time **or**
 - b. teach learners to independently gather the necessary materials.

When the appropriate setting/context presents itself, the teacher/practitioner can either set up the self-management system for the learner to use or teach the learner to gather all the necessary materials and independently initiate the use of the self-management system. While the former choice involves less teaching, the latter results in more independence for the learner. To teach the learner to independently gather the necessary materials, the teacher/practitioner uses prompting/prompt fading and reinforcement strategies similar to other steps in this module. Physical guidance will likely be needed initially help learners to get their materials and set them up. As learners become more successful, prompts can be faded to less intrusive forms such as gestural and verbal prompts. As with other steps, the teacher/practitioner reinforces (e.g., with verbal praise that is behavior-specific) the learner for all correct instances, both prompted and unprompted.

2. Teachers/practitioners provide learners with cues (e.g., verbal instruction, visual aid) that signal them to begin using self-management systems.
3. Teachers/practitioners teach learners how to self-record their behavior in the target setting by:

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- a. prompting them (as needed) to self-record accurately at the appropriate time,
- b. reinforcing all accurate self-recordings at the appropriate time (prompted and unprompted), and
- c. fading prompts until learners self-record (without prompts) with accuracy 80% of the time.**

** This criterion was selected because it give teachers/practitioners a clear criterion for evaluating learner progress with the self-management system. Furthermore, this criterion is commonly used in the literature to determine acquisition of skills.

Step 3 is very similar to Step 2b, except that learners are now self-recording their behaviors, and doing so in the targeted setting. Teachers provide prompts to ensure that learners accurately self-record. Reinforcement also is provided for all instances of self-recording at the appropriate time and with accuracy. Prompts are faded until the learner is able to independently record behaviors at the appropriate time with at least 80% accuracy.

Consider an example in which the goal is to decrease hitting during transitions. In this example, the initial criterion is five or less hits during a transition. That is, the learner must not hit more than five times during the transition to earn the reinforcer. In this example, the recording device used is a system in which the learner wears rubber bands on his left wrist. Each time he hits someone during a transition, he is supposed to record this behavior by moving a rubber band from his left wrist to his right wrist. Hence, as long as there are no more than five rubber bands on his right wrist at the end of the transition, he earns the reinforcer. But suppose that during a particular transition, he hits someone else five times, yet only moves a rubber band to his right wrist four times. In this case, he would be recording his behavior with 80% accuracy, which is still acceptable. If he hit someone else five times, yet only moved a rubber band to his right wrist three times, he would be recording his behavior with 60% accuracy, which would be unacceptable. The teacher should provide the learner with prompts to accurately self-record his hitting (that is, prompt him to move a rubber band from his left wrist to his right wrist each time he hits someone during a transition) until he can consistently do so independently with at least 80% accuracy.

4. Teachers/practitioners teach learners to gain access to reinforcement when the criterion is reached by:
 - a. prompting learners (as needed) to acquire reinforcement when the criterion is reached and
 - b. fading prompts until learners consistently and independently acquire reinforcement when the criterion is reached.

In addition to teaching learners to self-record independently, they also may need instruction to reinforce themselves or request reinforcement when they reach the set criterion for the targeted behavior. For example, a self-management system may be used to teach the learner to stay

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seated. The session in which the system will be used is five minutes long divided into five one-minute intervals, and the learner must accurately record that he stayed sitting for three of the five (60%) intervals to receive the reinforcer. The learner may independently record his behavior at the appropriate time (i.e., each time the cueing device signals the end of a one-minute interval), and he may be accurate in doing so. However, even if he meets the reinforcer criterion (i.e., 3 out of 5 intervals in which he stayed sitting), he may not know to request the reinforcer or reinforce himself for meeting the criterion. Therefore, if a learner meets the criterion for reinforcement, but does not independently request/self-deliver reinforcement, then the adult should prompt the learner to do so. Prompts should be faded until learners independently acquire the reinforcer (through requesting or self-reinforcing) whenever they meet the criterion.

Step 4. Promoting Independence with the Self-Management System

Once learners are accurately self-recording and independently requesting/self-delivering reinforcement when they meet their criterion, steps should be taken to promote further independence using the system.

1. Teachers/practitioners conduct ongoing, intermittent checks to determine whether learners continue to accurately self-record and acquire reinforcement when the criterion is met.

Initially, these checks should be very frequent. Once learners are fluently using the self-management system and accurately recording, Teachers/practitioners need to occasionally check learners' self-recording and acquisition of reinforcement to make sure they continue to do so accurately. This monitoring should be done during about 20% of all sessions. If the self-management session is used once a day, five days a week, this would mean conducting a check once a week. To conduct a check, Teachers/practitioners should observe learners while they are using their self-management systems and record data exactly as the learner does. If a frequency system is used, Teachers/practitioners should record each time learners demonstrate the target behavior. If an interval system is used, Teachers/practitioners record at the end of each interval whether target behaviors were correctly demonstrated. After the session is over, Teachers/practitioners compare their data to learners' self-recording data. If the learners' data is less than 80% accurate for three consecutive sessions, then Teachers/practitioners go back and re-teach learners how to accurately self-record.

2. Teachers/practitioners gradually increase the criterion by ensuring that learners are successful at the current criterion before increasing it further.

When learners are consistently earning reinforcement at the initial criterion, the criterion should be gradually increased. By making the reinforcement opportunities more intermittent, learners are encouraged to sustain and maintain their use of target behaviors. For example, if a learner was initially required to raise his hand five times to ask for help during independent work before earning a reinforcer, the adult could increase the criterion to six hand-raises, then seven, and so on. Teachers/practitioners should ensure that learners are consistently earning reinforcers at the new criterion before moving on to the next.

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3. Teachers/practitioners gradually increase the session length while simultaneously increasing the criterion.

Increasing the session length while simultaneously increasing the criterion ensures that learners are successful at the current session length and criterion before further increasing them. Whether an interval criterion or frequency criterion is used, Teachers/practitioners will reach a point where it is impossible or unfeasible to increase the session length and/or criterion further. For example, if an interval system is used, and the session consists of five minutes broken down into one-minute intervals, the number of successful intervals required to receive reinforcement cannot be increased beyond five.

If a frequency criterion is used, continuing to increase the criterion without increasing the session length would eventually lead to unnatural and/or inappropriately high rates of the target behavior. Imagine continuing to increase the number of hand raises required to receive the reinforcement in a five-minute session. Increasing the criterion to 10 hand raises would require a hand raise every 30 seconds on average. At some point, the learner would be demonstrating the target behavior more frequently than desired.

To further promote independence, the length of the session during which the self-management system is used should be gradually increased while simultaneously increasing the criterion for reinforcement. As with increasing the criterion, the learner should be consistently earning the reinforcer with the new session length and criterion before further increasing the criterion and/or the session length.

4. Teachers/practitioners gradually increase the interval length as the session length increases.

Gradually increasing the interval length ensures that learners are successful at the current interval length before increasing it further. This procedure can only be used to further promote independence with interval-based self-management systems. Within an interval system, the criterion should first be increased. When the session length is increased, the length of the interval can be increased as well. This is a very important step to promoting independence because it requires learners to accurately monitor and manage their behaviors for longer and longer periods of time before they self-record their performance.

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Sample Recording Sheets

Figure 1. Sample interval recording sheet

Instructions: This recording sheet is designed to be used with five time intervals. At the end of each interval, the learner circles whether he or she stayed and played with friends. After the last interval, the learner determines if he or she met the criterion to receive a reinforcer, which in this case is three of the five (60%) intervals.

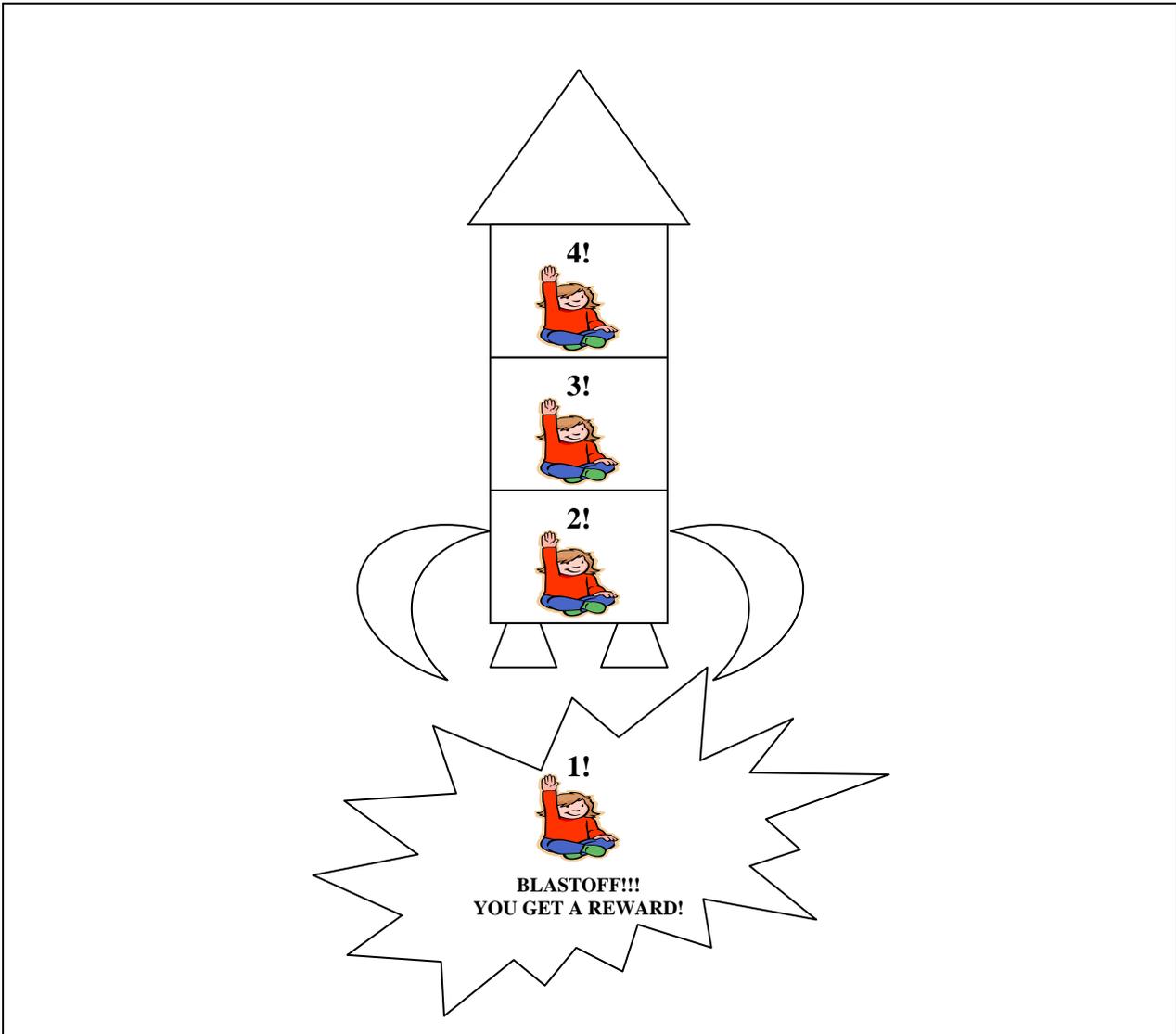
Did I stay and play with my friends?				
1	2	3	4	5
 	 	 	 	 
YES NO	YES NO	YES NO	YES NO	YES NO

Did I get 3 Smileys?	
	
YES	NO
↓	↓
GET A REWARD!!!	Try Again

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Figure 2. Sample recording sheet for a frequency criterion

Instructions: Each time the student raises her hand to ask a question, she circles the picture of the girl raising her hand. She starts at 4 and counts down to 4 (for a total of 4 hand raises). When she gets to 1, she earns a reinforcer.



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Self-Management Implementation Checklist

Busick, M., & Neitzel, J. (2009). *Self-management implementation checklist*. Chapel Hill, NC: National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.

Instructions: The Implementation Checklist includes each phase in the self-management process. Please complete all of the requested information including the site and state, individual being observed/interviewed, and the learner's initials. To assure that a practice is being implemented as intended, an observation is *always* preferable. This may not always be possible. Thus, items may be scored based on observations with the implementer, discussions and/or record review as appropriate. Within the table, record a 2 (implemented), 1 (partially implemented), 0 (did not implement), or NA (not applicable) next to each step observed to indicate to what extent the step was implemented/addressed during your observation. Use the last page of the checklist to record the target skill, your comments, whether others were present, and plans for next steps for each observation.

Site: _____ State: _____

Individual(s) Observed: _____ Learner's Initials: _____

Skills below can be implemented by a practitioner, parent, or other team member

	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
<i>Planning (Step 1)</i>									
Step 1. Preparing the Self- Management System	Score**								
1. To prepare the self-management system, engage in the following activities by:									
a. identifying the target behavior to increase or decrease and									
b. developing a clear description of the target behavior that adults agree upon and is presented in a format that learners are able to comprehend.									
2. Identify reinforcers that reward the learner by:									
a. asking family members,									
b. asking or formally assessing the learner, and									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
Step 1. Preparing the Self- Management System (cont.)	Score**								
c. using knowledge about the learner.									
3. Develop a data collection system by identifying:									
a. the type of data collection system (interval or frequency) and									
b. the initial criterion for the target behavior.									
4. Select self-monitoring recording and cueing (if interval system is used) devices that are appropriate based on learner characteristics and the setting in which the self-management system will be used.									
<i>Intervention and Progress Monitoring (Steps 2 – 4)</i>									
Step 2. Teaching Learners to Use the Self-Management System									
1. Instruct learners to demonstrate the correct behavior by:									
a. providing learners with a description of the target behavior in a comprehensible form,									
b. prompting learners as needed to demonstrate correct behavior upon request,									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
Step 2. Teaching Learners to Use the Self-Management System (cont.)	Score**								
c. reinforcing all correct demonstrations of behavior (prompted and unprompted), and									
d. fading prompts until learners consistently and independently demonstrate correct behavior upon request.									
2. Instruct the learner to discriminate between examples of correct and incorrect behavior by:	[Cross-hatched pattern]								
a. modeling examples and non-examples of the behavior;									
b. prompting the learner as needed to identify whether each modeled behavior is correct or incorrect;									
c. reinforcing all accurate identifications of correct and incorrect behavior (prompted and unprompted); and									
d. fading prompts until learner can consistently and independently identify examples of correct and incorrect behaviors that are increasingly similar to correct behavior.									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
Step 2. Teaching Learners to Use the Self-Management System (cont.)	Score**								
3. Teach learners how to use self-recording systems by:									
a. modeling examples of correct and incorrect behavior and prompting learners as needed to record accurately at the appropriate time;									
b. reinforcing all accurate recordings at the appropriate time (prompted and unprompted); and									
c. fading prompts until learners independently and accurately record behaviors 80% of the time.									
Step 3. Implementing the Self-Management System	Score**								
1. Either:									
a. provide learners with materials needed to use the self-management system at the appropriate time or									
b. teach learners to independently gather the necessary materials.									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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	Observation Date	1	2	3	4	5	6	7	8
Step 3. Implementing the Self-Management System (cont.)		Score**							
2. Provide learners with cues (e.g., verbal instruction, visual aid) that signal them to begin using self-management systems.									
3. Teach learners how to self-record their behavior in the target setting by:									
a. prompting them (as needed) to self-record accurately at the appropriate time,									
b. reinforcing all accurate self-recordings at the appropriate time (prompted and unprompted), and									
c. fading prompts until learners self-record (without prompts) with accuracy 80% of the time.									
4. Teach the learner to gain access to reinforcement when the criterion is reached by:									
a. prompting learners (as needed) to acquire reinforcement when the criterion is reached and									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
Step 3. Implementing the Self-Management System (cont.)	Score**								
b. fading prompts until learners consistently and independently acquire reinforcement when the criterion is reached.									
Step 4. Promoting Independence with the Self-Management System									
1. Conduct ongoing, intermittent checks to determine whether learners continue to accurately self-record and acquire reinforcement when the criterion is met.									
2. Gradually increase the criterion by ensuring that learners are successful at the current criterion before increasing it further.									
3. Gradually increase the session length while simultaneously increasing the criterion.									
4. Gradually increase the interval length as the session length increases.									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
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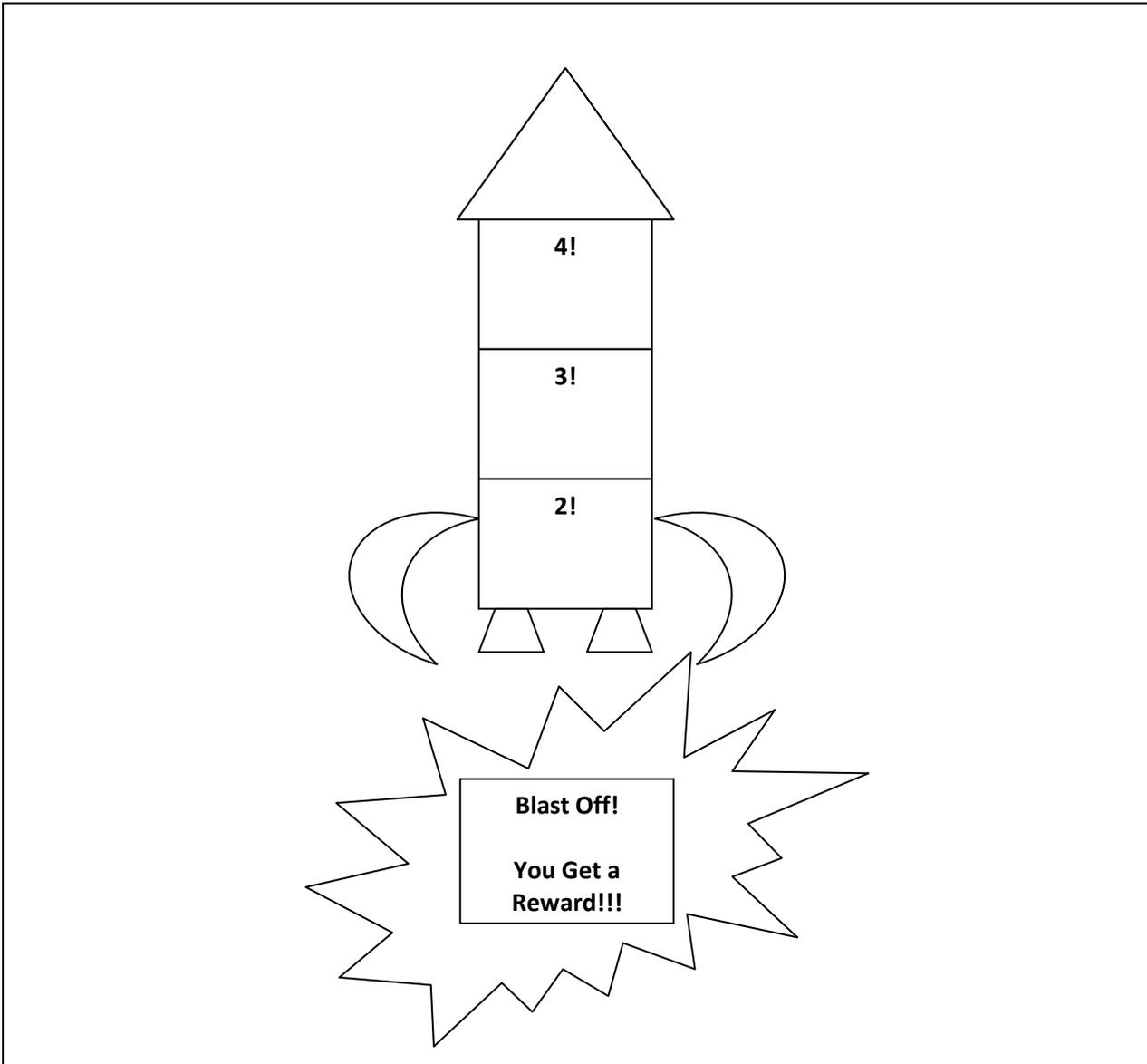
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Frequency Recording Sheet for Self-Management (Learner)

Learner: _____

Date: _____ Class/setting: _____

Target skill/behavior: _____



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Interval Recording Sheet for Self-Management (Learner)

Learner: _____ Class/setting: _____

Date: _____ Target skill/behavior: _____

Instructions: This recording sheet is designed to be used with five time intervals. At the end of each interval, the learner circles whether he or she stayed and played with friends. After the last interval, the learner determines if he or she met the criterion to receive a reinforcer.

1	2	3	4	5
 	 	 	 	 

How many smiles did I get? _____ Do I get a reward? _____

YES NO

↓

GET A REWARD!!!

↓

Try Again