Evidence Based Practice Training:
Exercise and Movement (EXM)

Adapted from Steinbrenner, J.R. et.al. (2020). Evidence-Based Practices for Children, Youth, and Young Adults with Autism Spectrum Disorder Report, National Clearinghouse on Autism Evidence and Practice (NCAEP)
https://ncaep.fpg.unc.edu/

What is CAPTAIN

The California Autism Professional Training And Information Network (CAPTAIN) is an interagency network developed to support the understanding and use of evidence based practices (EBPs) for individuals with Autism across the state of California

What is CAPTAIN

Marin County SELPA in partnership with CAPTAIN, are members of the Statewide System of Support as the Special Education Content Lead for Autism.

This project is funded by the California Department of Education and the California Collaborative for Educational Excellence.

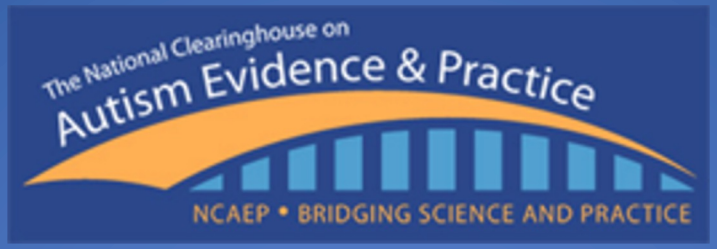
Levels of Professional Development to Reach Implementation

This is a Workshop/Training and is designed to increase your KNOWLEDGE of the topic. Implementation supports to assist you with use of this EBP will be outlined following the TRAINING/WORKSHOP

Before We Begin…

Please complete the **Pre-Training Survey** sent to your email

What are Evidence Based Practices?



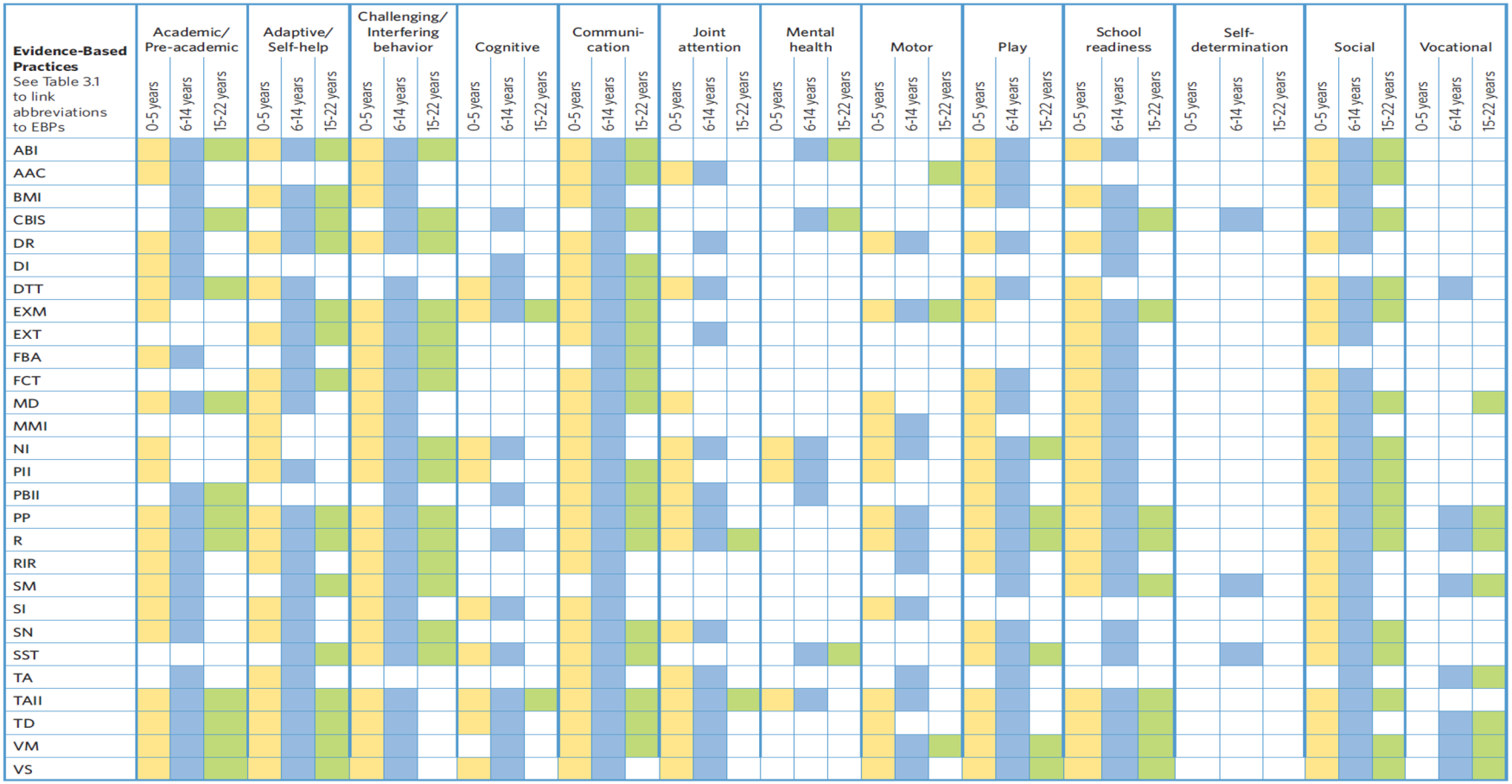
NCAEP definition of an EBP:

"Focused intervention practices that have evidence of efficacy in promoting positive outcomes for learners with ASD."

Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). Evidence-based practices for children, youth, and young adults with Autism. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team.

Evidence Based Practice Matrix (28 EBPs)

Table 3.7 Matrix of evidence-based practices, outcomes, and age categories



Evidence-Based Practices (See Table 3.1 to link abbreviations to EBPs)	Academic/ Pre-academic			Adaptive/ Self-help			Challenging/ Interfering behavior			Cognitive			Communi-cation			Joint attention			Mental health			Motor			Play			School readiness			Self-determination			Social			Vocational		
	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years	0-5 years	6-14 years	15-22 years
ABI																																				
AAC																																				
BMI																																				
CBIS																																				
DR																																				
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SI																																				
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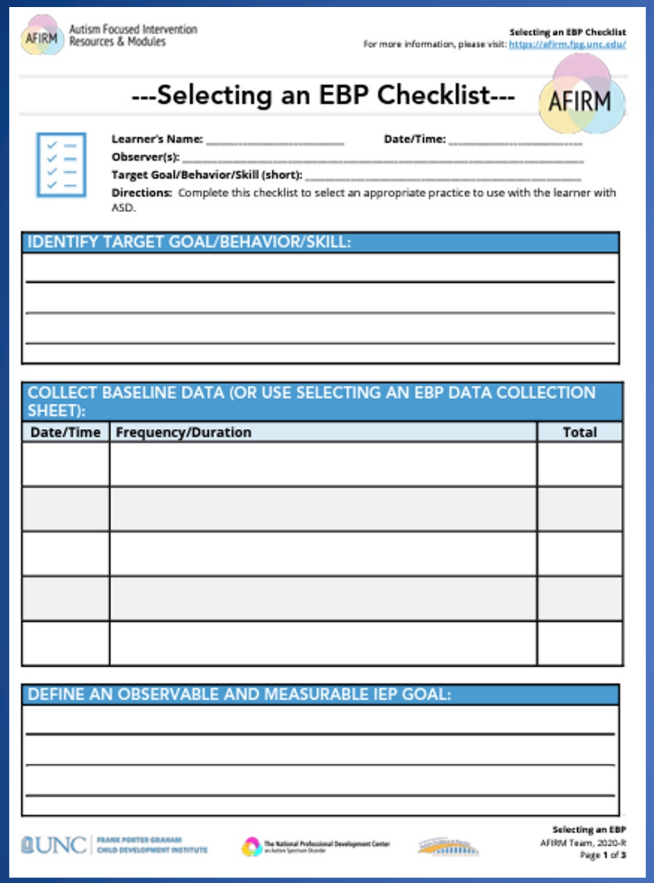
SST																																				
TA																																				
TAII																																				
TD																																				
VM																																				
VS																																				

Selecting EBPs

Before beginning a new practice with a learner, it is important to follow four planning steps

1. Identify the behavior
2. Collect baseline data on the behavior
3. Establish an observable and measurable goal
4. Choose an EBP
   - Consider the child and family characteristics
   - Consider the teacher and team characteristics
   - Consider other available resources

Selecting an EBP Checklist



Autism Focused Intervention Resources & Modules

Selecting an EBP Checklist
For more information, please visit: https://afirm.fpg.unc.edu/

---Selecting an EBP Checklist---

Learner's Name: _____ Date/Time: _____
Observer(s): _____
Target Goal/Behavior/Skill (short): _____
Directions: Complete this checklist to select an appropriate practice to use with the learner with ASD.

IDENTIFY TARGET GOAL/BEHAVIOR/SKILL:

COLLECT BASELINE DATA (OR USE SELECTING AN EBP DATA COLLECTION SHEET):

Date/Time	Frequency/Duration	Total

DEFINE AN OBSERVABLE AND MEASURABLE IEP GOAL:

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Selecting an EBP
AFIRM Team, 2020-R
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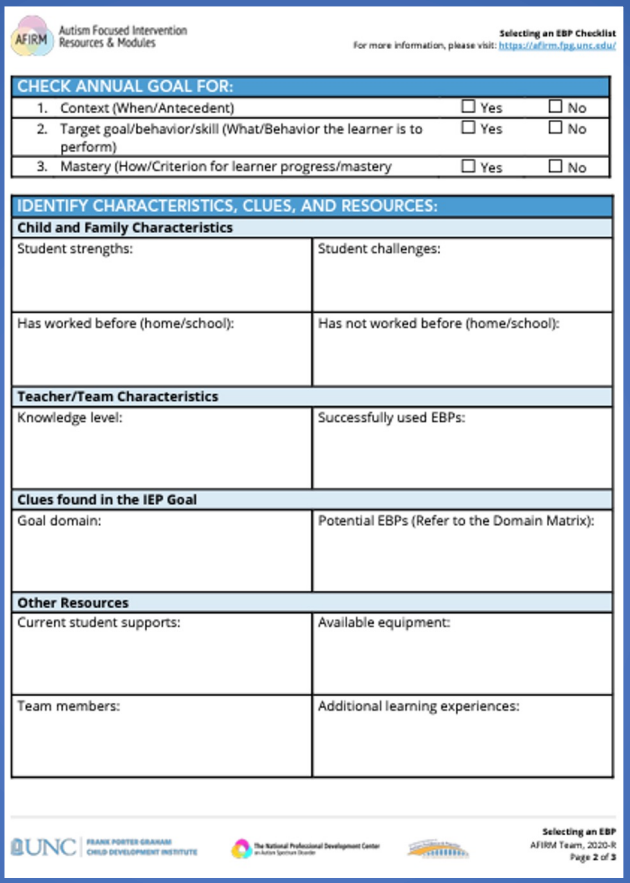

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CHECK ANNUAL GOAL FOR:

1. Context (When/Antecedent)	☐ Yes	☐ No
2. Target goal/behavior/skill (What/Behavior the learner is to perform)	☐ Yes	☐ No
3. Mastery (How/Criterion for learner progress/mastery	☐ Yes	☐ No

IDENTIFY CHARACTERISTICS, CLUES, AND RESOURCES:

Child and Family Characteristics

Student strengths:	Student challenges:
Has worked before (home/school):	Has not worked before (home/school):

Teacher/Team Characteristics

Knowledge level:	Successfully used EBPs:

Clues found in the IEP Goal

Goal domain:	Potential EBPs (Refer to the Domain Matrix):

Other Resources

Current student supports:	Available equipment:
Team members:	Additional learning experiences:

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AFIRM Team, 2020-R
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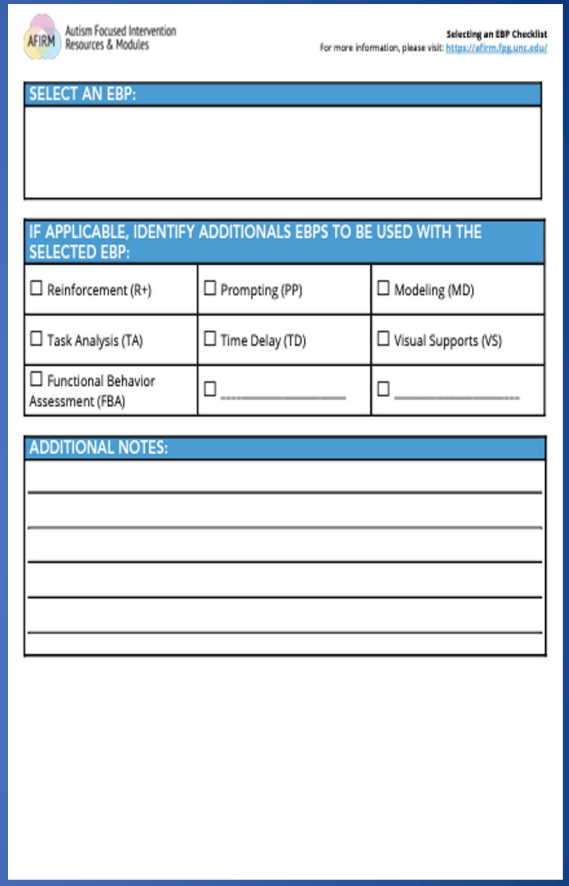

Autism Focused Intervention Resources & Modules

Selecting an EBP Checklist
For more information, please visit: https://afirm.fpg.unc.edu/

SELECT AN EBP:

IF APPLICABLE, IDENTIFY ADDITIONALS EBPS TO BE USED WITH THE SELECTED EBP:

☐ Reinforcement (R+)	☐ Prompting (PP)	☐ Modeling (MD)
☐ Task Analysis (TA)	☐ Time Delay (TD)	☐ Visual Supports (VS)
☐ Functional Behavior Assessment (FBA)	☐ _____	☐ _____

ADDITIONAL NOTES:

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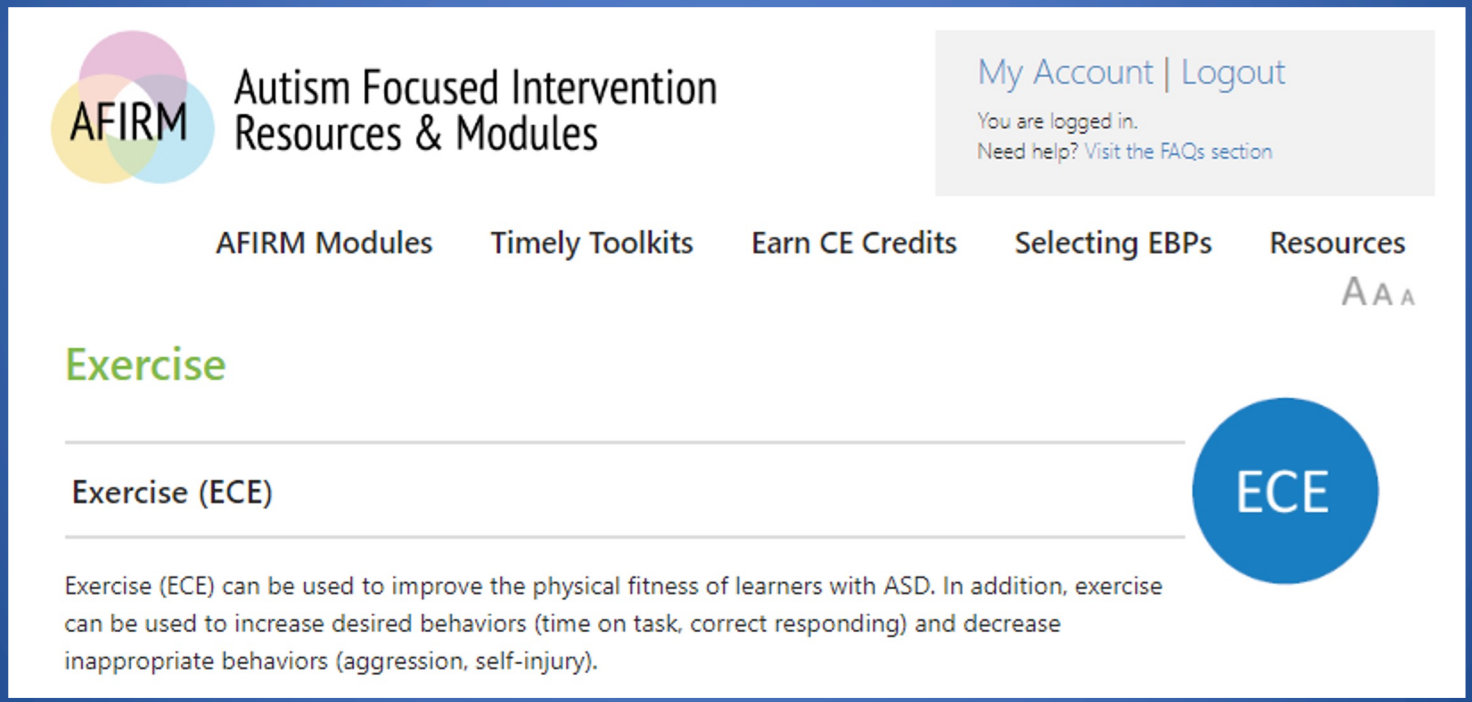
High Quality Training:

Autism Focused Intervention Resources and Modules (AFIRM)

Designed to help you learn the step-by-step process of planning for, using, and monitoring EBPs with learners with Autism from birth to 22 years of age



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Core Components: Learning Objectives

- Learn the basic knowledge about exercise.

- Learn how to apply Exercise and Movement (EXM) in activity based scenarios that promote real-world application.

What are Evidence Based Practices?

The National Clearinghouse on Autism Evidence & Practice
NCAEP • BRIDGING SCIENCE AND PRACTICE

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Evidence for EXM (Age and Domains)

Outcome Areas		Age Ranges					
		0-2 Toddlers	3-5 Preschoolers	6-11 Elementary School	12-14 Middle School	15-18 High School	19-22 Young Adults
	Communication		✓	✓	✓	✓	
	Social		✓	✓	✓	✓	
	Joint attention						
	Play		✓				
	Cognitive		✓	✓	✓	✓	
	School readiness		✓	✓	✓	✓	
	Academic/ Pre-academic		✓				
	Adaptive/ self-help			✓	✓	✓	
	Challenging/ Interfering behavior		✓	✓	✓	✓	
	Vocational						
	Motor		✓	✓	✓	✓	
	Mental health						
	Self-determination						

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What is Exercise and Movement?

Interventions that use physical exertion, specific motor skills/techniques, or mindful movement to target a variety of skills and behaviors.

What is Exercise and Movement?

Movement activities can include sports/recreation activities, martial arts, yoga, or other mindful practices that focus on specific sets of motor skills and techniques.

EXM interventions may incorporate a warm-up/cool down and aerobic, strength, stretching, and/or skillful motor activities and be performed in individual or group/team-based settings.

EXM is often used in conjunction with these EBPs: Prompting, Modeling, Reinforcement, and Visual Supports.

Why do we use EXM?

The integration of daily opportunities for physical activity for learners with Autism is important for improving their basic physical fitness.

In addition to physical fitness, exercise also can be used as an intervention for learners with Autism to increase desired behaviors, such as academic engagement, time on task, correct responding, and task completion.

Exercise can decrease challenging behaviors, such as aggression, self-injury, self-stimulatory/stereotypic behaviors, and time off task.

Types of Exercises

VIDEO

Running 	**Swimming laps** 	**Stationary Bike** 
Jumping Hula Hoop 	**Trampoline Jumping** 	**Arm Curls** 
Hopping over Jump Rope 	**Wall Push-ups** 	**Yoga** 

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Types of Exercises

Hopping over Jump Rope 	Wall Push-ups 	Yoga 
Sit-ups 	Chair Raises 	Toe Raises 
Leg Kicks 	Crab Walking 	Lunges 
Kick Ball 	Jumping Rope 	Jumping Jacks 
Bicycle 	Weights 	

Goals of Exercise and Movement (EXM)

- To increase physical fitness
- To increase desired/appropriate behaviors
- To decrease challenging behaviors

Physical Fitness Might Be Measured By Several Distinct But Associated Factors

- Cardiovascular intensity and duration (e.g., number of repetitions doing the shuttle run, which involves sprinting back and forth)

- Muscular strength or endurance (e.g., bicep curls with hand weights, holding a plank position)

- Body composition analysis (i.e. height to weight ratio, body mass index, measurements)

Physical Fitness Might Be Measured By Several Distinct But Associated Factors (continued)

- Scales or checklists designed to measure mastery of skills specific to a physical fitness activity (these could be aquatic skills, sports skills, etc.)
- Measures of frequency or duration of engagement in activity

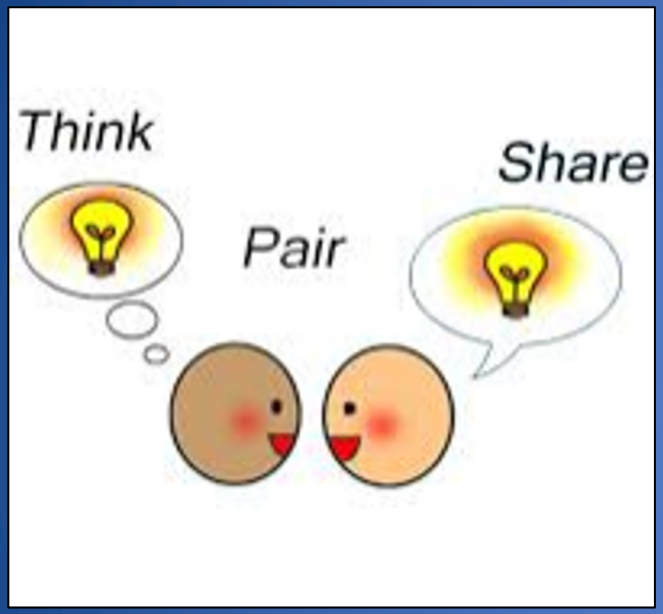
Desired/Appropriate Behaviors To Target Might Include:

- Academic engagement
- Time on task
- Correct responding
- Task completion

Challenging Behaviors Might Include:

- Aggression (physical and/or verbal)
- Self-injury
- Self-stimulatory/stereotypic behaviors (which may be further divided into physical/motor stereotypic and visual self-stimulation)
- Time off task

Think-Pair-Share



Do you have a student with Autism for whom you think EXM would be helpful?

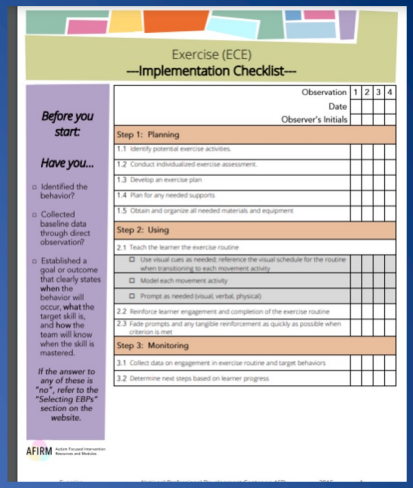
What desired behaviors would be increased?

What challenging behaviors would be decreased?

How can EXM Help Students with Autism?

- Exercise can help learners in a very basic way by improving their physical fitness and motor skills.
- Better physical fitness has long-term positive implications for people's health.
- Improved physical fitness and skills may also enable learners with Autism to be better prepared to engage in activities with peers, which might thereby increase social opportunities.
- Desired behaviors increase and inappropriate behaviors decrease, resulting in better academic engagement and enhanced opportunities for learning and interacting with others.

Getting Started


Exercise (ECE)
—Implementation Checklist—

Before you start:

Have you...

- Identified the behavior?
- Collected baseline data through direct observation?
- Established a goal or outcome that clearly states when the behavior will occur, what the target skill is, and how the team will know when the skill is mastered.

If the answer to any of these is "no", refer to the "Selecting EBPs" section on the website.

	Observation	1	2	3	4
	Date				
	Observer's Initials				
Step 1: Planning					
1.1	Identify potential exercise activities				
1.2	Conduct individualized exercise assessment				
1.3	Develop an exercise plan				
1.4	Plan for any needed supports				
1.5	Obtain and organize all needed materials and equipment				
Step 2: Using					
2.1	Teach the learner the exercise routine				
☐	Use visual cues as needed; reference the visual schedule for the routine when transitioning to each movement activity				
☐	Model each movement activity				
☐	Prompt as needed (visual, verbal, physical)				
2.2	Reinforce learner engagement and completion of the exercise routine				
2.3	Fade prompts and any tangible reinforcement as quickly as possible when criterion is met				
Step 3: Monitoring					
3.1	Collect data on engagement in exercise routine and target behaviors				
3.2	Determine next steps based on learner progress				

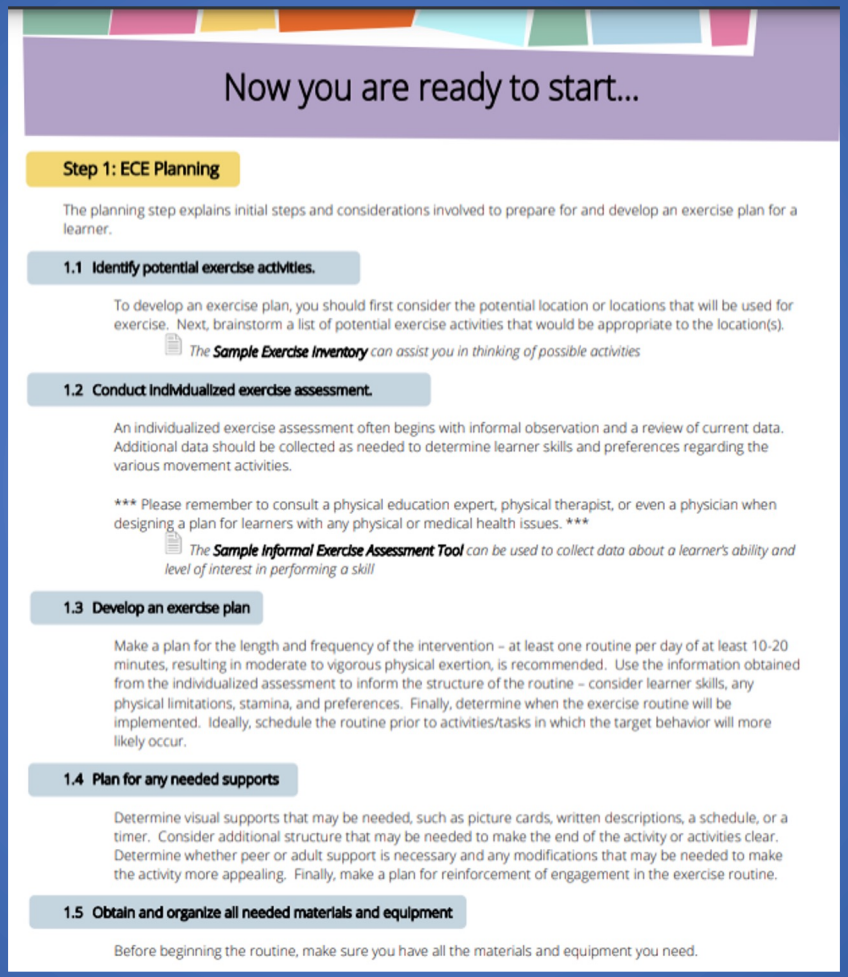
AFIRM Autism Focused Intervention Resources and Modules

Have you. . .?

- Identified the behavior?
- Collected baseline data through direct observation?
- Established a goal or outcome that clearly states: when the behavior will occur, what the target skill is, and how the team will know when the skill is mastered?

If the answer to any of these is "no," review the process of how to select an EBP.

Check Out the AFIRM Planning Guide



Now you are ready to start...

Step 1: ECE Planning

The planning step explains initial steps and considerations involved to prepare for and develop an exercise plan for a learner.

1.1 Identify potential exercise activities.

To develop an exercise plan, you should first consider the potential location or locations that will be used for exercise. Next, brainstorm a list of potential exercise activities that would be appropriate to the location(s).

*The **Sample Exercise Inventory** can assist you in thinking of possible activities*

1.2 Conduct individualized exercise assessment.

An individualized exercise assessment often begins with informal observation and a review of current data. Additional data should be collected as needed to determine learner skills and preferences regarding the various movement activities.

*** Please remember to consult a physical education expert, physical therapist, or even a physician when designing a plan for learners with any physical or medical health issues. ***

*The **Sample Informal Exercise Assessment Tool** can be used to collect data about a learner's ability and level of interest in performing a skill*

1.3 Develop an exercise plan

Make a plan for the length and frequency of the intervention – at least one routine per day of at least 10-20 minutes, resulting in moderate to vigorous physical exertion, is recommended. Use the information obtained from the individualized assessment to inform the structure of the routine – consider learner skills, any physical limitations, stamina, and preferences. Finally, determine when the exercise routine will be implemented. Ideally, schedule the routine prior to activities/tasks in which the target behavior will more likely occur.

1.4 Plan for any needed supports

Determine visual supports that may be needed, such as picture cards, written descriptions, a schedule, or a timer. Consider additional structure that may be needed to make the end of the activity or activities clear. Determine whether peer or adult support is necessary and any modifications that may be needed to make the activity more appealing. Finally, make a plan for reinforcement of engagement in the exercise routine.

1.5 Obtain and organize all needed materials and equipment

Before beginning the routine, make sure you have all the materials and equipment you need.

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Identify Potential Exercise Activities

- Will the student be inside, outside, or both? If outside, are there alternative options when there is poor weather?
- Will the student be going to a gym?
- Will the student go to a nearby location, such as the hallway or another room?
- Will the student stay in the classroom?

Identify Potential Exercise Activities

(Continued)

- What is the goal of the exercise routine (e.g. improve specific skills, participate in recreational sports, improve health and fitness)?
- What are the interests, goals, and present skills and abilities of the student?
- Will another adult or peer need to be included in the exercise activities to assist with visual supports and cues or monitoring form and posture to prevent injury?

Conduct an Individualized Exercise Assessment

Informal observation: Conducting an assessment often begins with informally observing a learner and his or her current interests and strengths. Are there activities towards which the learner currently gravitates? Does the learner like to run, jump, spin, or curl up in a ball? What does he or she do in the gym or during recess time? Does the learner already have an interest in any sports or movement activities? Are there special interests that might be incorporated into a movement activity to make it more appealing? Often, these informal observations can give enough information to develop an initial exercise routine. Also, keep in mind this "routine" might only involve one activity, especially if it is an activity in which the learner will easily engage.

Conduct an Individualized Exercise Assessment

Review current data: Additional data may already be available that will provide insight into an appropriate selection of exercise activities for the learner. If available, consult the learner's individualized education plan and previous assessments. Have there recently been assessments related to fitness or motor skills? Does the learner currently have adaptive physical education services and relevant goals? Is the learner currently in a physical education class, and if so, what feedback can that teacher provide about the learner's skills and interests? Ask former teachers and family members about their observations and knowledge regarding possible exercise. If using exercise in a school setting, check the student's file for health information or a physical. Make sure you understand the student's health needs (for example, asthma, current medications).

Conduct an Individualized Exercise Assessment

Collect additional data as needed: Informal observation and a review of current data may be sufficient for setting up an initial exercise routine. However, obtaining more data will be helpful in guiding the development and assessment of the exercise plan. Assessment of exercise and related skills can be accomplished through setting up opportunities and rating the learner's ability and interest in the activity. For specific activities, someone might need to teach the activity to the learner first through modeling and practice. Picture cards might be needed as cues, and verbal and/or physical prompts may also be helpful. Exposure and multiple opportunities to engage in the activity may be necessary before making a judgment about specific activities. Be careful the learner does not engage in an exercise activity incorrectly for a prolonged period of time. Participating in physical activities incorrectly, might result in injury.

Develop an Exercise Plan

- This includes the type of activity along with its anticipated duration and frequency of implementation
- The exercise routine itself;
- A planned time and location for the exercise routine to occur.
- It may also include established heart rate checks, rating perceived effort, organizing equipment and materials, cleaning the exercise area and water breaks.

Plan for Any Needed Supports

Determine any visual supports that may be needed for the learner:

This may include:

- Picture cards of each activity on the exercise routine
- Written descriptions of each movement activity on the exercise routine
- A visual schedule of the exercise routine
- A visual timer for completion of the exercise routine

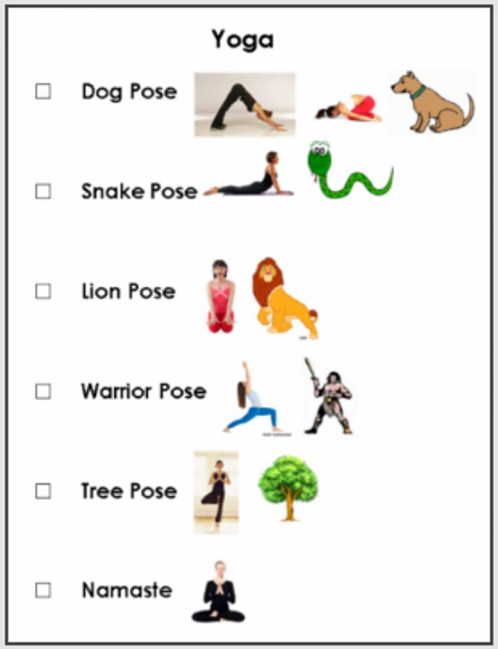


Image Credit:
TEACCH Autism Program
The learner checks each step off this exercise checklist.

Plan for Any Needed Supports

Additional Structures:

Consider additional structure that may be needed to help the learner stay engaged and have a clearer sense of when the activity is completed. Examples include a timer, a stopwatch, a special selection of songs that play during the routine, or an adult that counts down exercise activities or repetitions.

Introduce Equipment:

Introduce any equipment such as exercise machines before the first exercise session and review safety issues as needed.

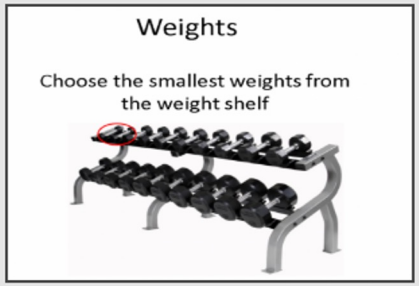


Image Credit:
TEACCH Autism Program
This picture card, with a written description, provides the learner with key information about how to select a weight.

Plan for Any Needed Supports

Consider Models:

Will an adult or peer assistant be needed to model and engage in the activity along with the learner?

Image courtesy of: Leslie Fox

Adult models how to walk on a treadmill.

Plan for Any Needed Supports

Special Interests Modifications:

Determine any modifications to the exercise routine that may make the activity more appealing. For example, instead of just running laps, could the learner carry a favorite object, or even run relay-race style by handing off and retrieving favorite items? Can a special interest be incorporated into the routine? This might include alternative names for the exercise time that reference the special interest, props or pictures related to the special interest that are incorporated into the routine, etc.

Image Credit:
TEACCH Autism Program

Yoga poses are demonstrated with a picture. To make the exercise more appealing, the princess cards are used to check off the completion of each pose.

Plan for Any Needed Supports

Reinforcement Plan:

Make a plan for reinforcement of engagement in the exercise routine. This could include a sticker chart, a token system, or other similar system. Reinforcement may also simply be verbal praise. Consider the schedule of reinforcement. Will the learner need to be reinforced at the end of the week, at the end of the day, or immediately after participation in the routine? Will the learner need reinforcement throughout the routine? Some learners may initially require more reinforcement, but that reinforcement may be faded for learners who begin to develop some intrinsic enjoyment of the exercise activities.

Image courtesy of: Leslie Fox
Learner selects stickers as a reward for completing exercise routine.

Level of Support:

Make a plan that supports the level of independence and generalization desired for the learner.

Obtain and Organize All Needed Materials and Equipment

- This is potentially a simple step, but one that should not be overlooked – before beginning the routine, you will need to make sure you have all the materials and equipment you need.

- It would be better to make any picture cards or visual schedules for the exercise routine in advance, rather than trying to start the exercise routine without providing the proper supports, which potentially could result in a confusing or frustrating experience for the learner and/or even lead to injury.

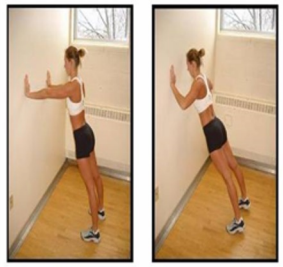
- It is often better to start with more support and then fade that support as appropriate when the learner becomes more comfortable with the new activity.

Teach the Learner the Exercise Routine

USE VISUAL SUPPORTS

- May be written – words or phrases describing each movement activity included in the routine.
- May be actual photographs of an item used in the routine (such as a trampoline) or a person engaging in the routine.
- May be simple line drawings symbolizing each movement activity.
- May include a combination of pictures and words.

Image Credit: TEACCH Autism Program
A yoga mat has been adapted for the learner to clearly see where to stand for a yoga pose.



Wall Push-up

Stand with feet shoulder width apart.

Arms extended and palms flat against the wall.

Bend arms and slowly lower body to the wall – keeping eyes focused in front

Slowly extend arms to starting position

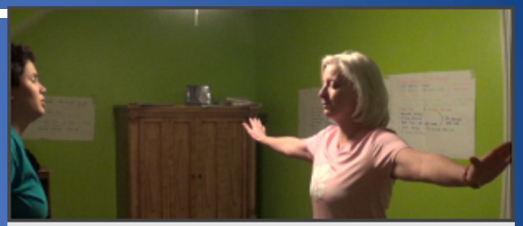
Courtesy of Leslie Fox

Let's Practice with Feedback!

Write out a task analysis using words/sentence and visuals that describes how to walk on a treadmill.

Model Each Movement Activity:

- Show the learner what is expected.



Courtesy of Leslie Fox

- It might also be beneficial to have a partner (the teacher, a teacher assistant, a peer, a staff volunteer, or even a family volunteer) to engage in the routine with the learner, particularly in the early stages of teaching.

Prompt As Needed

- Learners might need other prompts as they are learning a new skill.
- For movement activities, these might be physical prompts to help guide them in producing the correct movement.
- Visual prompts can include referencing the visual supports.
- Some learners might also respond to verbal prompts – specific to production of the movement activity or more general encouragement to continue.

Courtesy of Leslie Fox

Two Aspects of Exercise Routine That May Require Reinforcement:

Engagement and Completion of Exercise

Consider the two aspects of the routine that may require reinforcement:

Engagement in the activity itself

If the learner is required to participate in an exercise activity for a certain amount of time, he or she may need to be rewarded for engagement in the activity. For example, the learner might earn stickers for every 2 minutes he or she jogs, stretches, or jumps. The stickers might be sufficiently reinforcing in themselves, or they might be collected and applied to later access to a preferred item or activity.

Completion of the exercise routine

If there are multiple movement activities within a routine, perhaps the learner could earn a sticker/check mark/point/etc. for each activity as it is completed. Alternatively, the learner may earn some type of reinforcement after the entire routine has been completed. Yet another option is for the daily schedule to be designed to offer reinforcement by including a preferred activity after the learner has completed the exercise routine.

Image courtesy of: Leslie Fox
Learner selects stickers as a reward for completing exercise routine.

Thin Prompts and Any Tangible Reinforcement as Quickly as Possible When Criterion Is Met

- Some research suggests that the exercise routine itself might become inherently motivating.
- Thus, it is particularly important to attempt to thin any additional reinforcement plan as soon as the learner has learned the routine and can successfully complete the activities.
- The thinning of reinforcement will be individualized to each learner.

Collect Data on Engagement in Exercise Routine and Target Behaviors

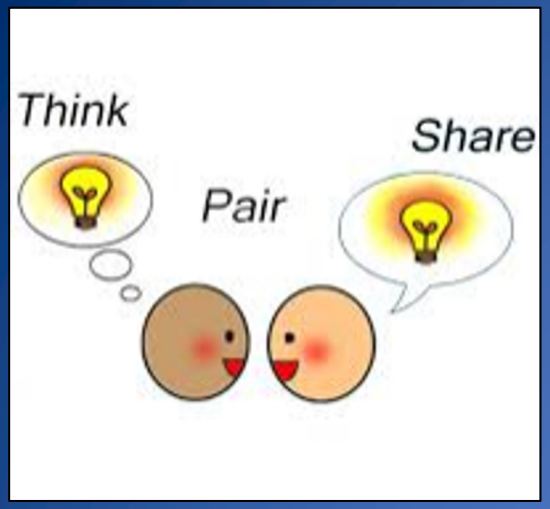
Data collection needs to include two elements:

1) information regarding the learner's participation in the exercise routine, and, when used as an antecedent intervention,

2) information regarding the target behaviors of the learner.

Collecting Data on EXM

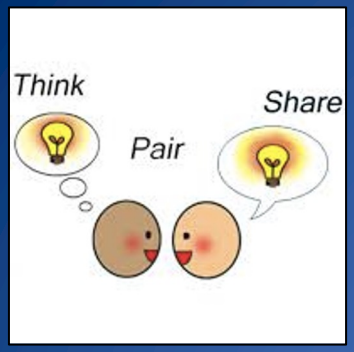
Consider having the learner with Autism complete a self-assessment regarding their perceived effort of level of difficulty of the routine.



Activity

Watch this AFIRM Video to learn more about how to monitor EXM

https://afirm.fpg.unc.edu/exercising/lesson-4-monitor-ece/monitoring-activity



My Takeaways

1. What are 4 things you remember from today's training?

1. What are 2 things you see yourself doing?

1. What is the 1 thing you can implement tomorrow?

After the Training…

Please complete the **Post-Training Survey** that will be sent to your email

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