



Autism Focused Intervention
Resources & Modules

ASI

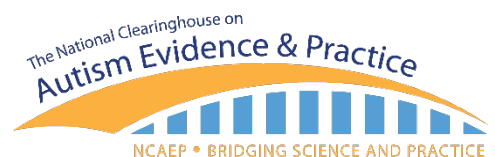
EVIDENCE-BASED PRACTICE BRIEF PACKET:

AYRES SENSORY INTEGRATION® (ASI) /SENSORY INTEGRATION THERAPY

UNC Frank Porter Graham Child Development Institute

Autism Focused Intervention Resources & Modules

Nowell, S., Sam, A., Waters, V., Dees, R., & AFIRM Team, 2021



---Overview of Content---

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1. **Table of ASI Contents:** This list details the specific ASI resources that apply to this practice.
2. **What is ASI:** A quick summary of salient features of the evidence-based practice, including what it is, who it can be used with, what skills it has been used with, and settings for instruction.
3. **Evidence-base:** The evidence-base details the National Clearinghouse on Autism Evidence and Practice (NCAEP) criteria for inclusion as an evidence-based practice and the specific studies that meet the criteria for this practice.
4. **Planning Checklist:** This checklist details the steps for planning for this practice, including what prerequisite learning of practices are needed, collecting baseline data of the target goal/behavior/skill if needed, and what materials/resources are needed.
5. **Other Resources:** Other resources may include decision trees, checklists, and/or template forms that will support the use of this practice.
6. **Data Collection Form(s):** Use this form as a method for collecting and analyzing data to determine if the learner with autism is making progress towards the target goal/behavior/skill.
7. **Step-by-Step Guide:** Use this guide as an outline for how to plan for, use, and monitor this practice. Each step includes a brief description as a helpful reminder while learning the process.
8. **Implementation Checklist:** Use this checklist to determine if this practice is being implemented as intended.
9. **Tip Sheet for Professionals:** Use this tip sheet, intended for professionals working with learners with autism, as a supplemental resource to help provide basic information about this practice.
10. **Parent Guide:** Use this guide intended for parents or family members of learners with autism to help them understand basic information about this practice and how it is being used with their child.
11. **Additional Resources:** This list provides additional information for learning more about this practice as well as resources.
12. **CEC Standards:** This list details the specific CEC standards that apply to this practice.
13. **Glossary:** This glossary contains key terms that apply specifically to this practice.
14. **References:** This list details the specific references used for developing this ASI module in numerical order.

This **ASI Brief Packet** will support your use of:
Ayres Sensory Integration®



---Table of ASI Contents---

ASI

---Overview of Content--- 2

---Table of ASI Contents--- 3

---Ayres Sensory Integration®--- 4

---Types of Sensory Modalities--- 5

---Evidence-base--- 6

---Assessment for ASI Checklist--- 8

---Data Collection: Observations--- 9

---Session Plan--- 10

---Planning Checklist--- 11

---Session Components--- 14

---Generalization Plan--- 15

---Data Collection--- 16

---Monitoring Progress Checklist--- 17

---Step-by-Step Guide--- 19

---Implementation Checklist--- 23

---Tip Sheet for Professionals--- 24

---Parent’s Guide--- 26

---Additional Resources--- 27

---Glossary--- 29

---References--- 32

---CEC Standards--- 34



---Ayres Sensory Integration®---

ASI

WHAT IS ASI?

Ayres Sensory Integration® (ASI) targets a learner's ability to process and internally integrate sensory information from their body and the environment. ASI can be used to increase student communication, socialization, cognitive, and adaptive skills while reducing challenging behaviors in learners with identified challenges in sensory processing.

EVIDENCE-BASE:

Based upon the 2020 systematic review conducted by the National Clearinghouse on Autism Evidence and Practice (NCAEP), this practice is a focused intervention that meets the evidence-based practice criteria with 3 single case design studies. This practice has been effective for preschoolers (3-5 years), elementary school learners (6-11 years), and middle school learners with autism. Studies included in the 2020 EBP report (Steinbrenner et al., 2020) detail how this practice can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, adaptive/self-help, challenging/interfering behavior, cognitive, communication, motor, and social.

DISCLAIMER: The evidence base at this time only supports *Ayres Sensory Integration*. *Ayres Sensory Integration* requires specialized training with a certified provider to implement with fidelity. This training is most commonly completed by Occupational Therapists and, in some cases, other licensed therapists. This module is not intended to replace training in ASI and the certification process, but rather, to introduce basic knowledge of ASI as an evidence-based practice for learners with autism. (Nowell et al., 2021)

HOW IS ASI BEING USED?

This practice can be used by practitioners trained in Ayres Sensory Integration®. Other support staff, like classroom teachers, school-based staff, and families, may collaborate with ASI providers to support parts of the ASI process.

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<https://afirm.fpg.unc.edu/ayres-sensory-integration>

---Types of Sensory Modalities---



Learn more about the types of sensory modality to support your understanding of Ayres Sensory Integration.

For more information about the types of sensory modality please visit <https://afirm.fpg.unc.edu/>.

- Visual input (e.g., flickering lights)

**VISUAL:
VISION/SIGHT**

- Auditory input (e.g., alarms, traffic)

**AUDITORY:
HEARING**

- Sensations on the skin (e.g., sunscreen, wet foods)

TACTILE: TOUCH

- Flavors in the mouth (e.g., spicy, sour).

**GUSTATORY:
TASTE**

- Smells (e.g., cooking smells, craft supply smells)

**OLFACTORY:
SMELL**

- Positioning and force of the body (e.g., learner may have challenges with daily tasks like engaging zippers or tying shoes, learner may break delicate items because of lack of awareness of the force needed to keep it intact)

**PROPRIOCEPTIVE:
MUSCLE
CONTRACTION & JOINT
POSITION**

- Equilibrium and body movement in space (e.g., may appear clumsy, off-balance, or have out-of-control movements). A learner may seek or avoid linear movements like swinging or rotary movements like spinning.

**VESTIBULAR: BALANCE
& MOVEMENT**

---Evidence-base---

ASI

The National Clearinghouse on Autism Evidence and Practice has adopted the following criteria to determine if a practice is evidence-based. The 2020 EBP report (Steinbrenner et al., 2020) provides more information about the systematic review process.

Efficacy must be established through high-quality, peer-reviewed research in scientific journals using:

- At least 2 randomized or quasi-experimental group design studies, or
- At least 5 single subject/case design studies, or a
- Combination of evidence of 1 randomized or quasi-experimental group design study **and** 3 single subject/case design studies

OVERVIEW:

Based upon the 2020 systematic review conducted by the National Clearinghouse on Autism Evidence and Practice (NCAEP), this practice is a focused intervention that meets the evidence-based practice criteria with 3 single case design studies. This practice has been effective for preschoolers (3-5 years), elementary school learners (6-11 years), and middle school learners with autism. Studies included in the 2020 EBP report (Steinbrenner et al., 2020) detail how this practice can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, adaptive/self-help, challenging/interfering behavior, cognitive, communication, motor, and social.

In the table below, the instructional outcomes identified by the evidence base are shown by age of participants.

EVIDENCE-BASE:							
	ACADEMIC	ADAPTIVE	CHALLENGING	COGNITIVE	COMMUNICATION	MOTOR	SOCIAL
3-5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6-11	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12-14			Yes			Yes	Yes



EARLY INTERVENTION (0-2 YEARS):

No studies as of the 2020 EBP Report

PRESCHOOL (3-5 YEARS):

- *Kashefimehr, B., Kayihan, H., & Huri, M. (2018). The effect of sensory integration therapy on occupational performance in children with autism. *OTJR: Occupation, Participation, and Health*, 38(2), 75-83. <https://doi.org/10.1177/1539449217743456>
- *Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., van Hooydonk, E., Freeman, R., Leiby, B., Sendeki, J., & Kelly, D. (2014). An intervention for sensory difficulties in children with autism: A randomized trial. *Journal of Autism and Developmental Disorders*, 44(7), 1493-1506. <https://doi.org/10.1007/s10803-013-1983-8>

ELEMENTARY SCHOOL (6-11 YEARS):

- *Kashefimehr, B., Kayihan, H., & Huri, M. (2018). The effect of sensory integration therapy on occupational performance in children with autism. *OTJR: Occupation, Participation, and Health*, 38(2), 75-83. <https://doi.org/10.1177/1539449217743456>
- *Pfeiffer, B. A., Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, L. (2011). Effectiveness of sensory integration interventions in children with autism spectrum disorders: A pilot study. *The American Journal of Occupational Therapy*, 65(1), 76-85. <https://doi.org/10.5014/ajot.2011.09205>
- *Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., van Hooydonk, E., Freeman, R., Leiby, B., Sendeki, J., & Kelly, D. (2014). An intervention for sensory difficulties in children with autism: A randomized trial. *Journal of Autism and Developmental Disorders*, 44(7), 1493-1506. <https://doi.org/10.1007/s10803-013-1983-8>

MIDDLE SCHOOL (12-14 YEARS):

- *Pfeiffer, B. A., Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, L. (2011). Effectiveness of sensory integration interventions in children with autism spectrum disorders: A pilot study. *The American Journal of Occupational Therapy*, 65(1), 76-85. <https://doi.org/10.5014/ajot.2011.09205>

HIGH SCHOOL (15-18 YEARS):

No studies as of the 2020 EBP Report

YOUNG ADULT (19-22 YEARS):

No studies as of the 2020 EBP Report

Note: * denotes the study has participants in at least two age ranges; **new studies since 2011 (2012 till 2017) are denoted in bold**

---Assessment for ASI Checklist---

ASI



Learner's Name: _____

Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill (short): _____

Directions: Complete this worksheet to assess/determine if an ASI assessment is needed for the learner.

SIGNS A STUDENT MAY BENEFIT FROM AN ASI ASSESSMENT:

1. Is the learner distracted by sensory stimuli in a way that intrudes with their academic goals? Yes No

2. Is the learner showing challenging behaviors in response to sensory stimuli? Yes No

3. Does the learner seek certain sensory input in a way that interferes with their academic or social goals? Yes No

4. Does the learner avoid certain age-appropriate activities due to suspected sensory issues? Yes No

5. Is the learner distracted by sensory stimuli in a way that intrudes with social goals? Yes No



---Data Collection: Observations---



Learner's Name: _____ Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill (short): _____

Directions: Collect observational data on the learner's sensory responses and behaviors

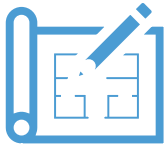
OBSERVATIONAL DATA:

Time	Activity	Sensory Input	Behavior Observed

ANECDOTAL NOTES:



---Session Plan---



Learner's Name: _____ Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill: _____

Directions: Use this form to develop a session plan for an ASI session for the learner.

Objective/Goal(s):		
Sensory Modality:	Activities:	Materials Needed:
Visual: Vision/Sight		
Auditory: Hearing		
Tactile: Touch		
Gustatory: Taste		
Olfactory: Smell		
Proprioceptive: Muscle contraction & Joint position		
Vestibular: Balance & Movement		



---Planning Checklist---

ASI



Learner's Name: _____ **Date/Time:** _____

Observer(s): _____

Target Goal/Behavior/Skill (short): _____

Directions: Complete this checklist to determine if this is an appropriate practice to use with the learner with autism as well as if this practice is ready to be implemented.

GENERAL PLANNING:

1. Has the target goal/behavior/skill been identified?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Has baseline data and/or a functional behavior assessment been collected through direct observation of the learner?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Is the target goal/behavior/skill measurable and observable? Does it clearly state what the target goal/behavior/skill is, when it will occur, and how team members/observers will know it has been mastered?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Is this selected practice appropriate for the learner's target goal/behavior/skill?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. Does the learner have needed prerequisite skills/abilities?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. Does the learner require additional adaptations/modifications/supports? Such as visual supports or a communication device?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7. Are additional materials and/or resources for using this selected practice ready and available?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

ASI SPECIFIC PLANNING:

1. Is the learner distracted by sensory stimuli in a way that intrudes with their academic goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Is the learner showing challenging behaviors in response to sensory stimuli?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Does the learner seek certain sensory input in a way that interferes with their academic or social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No



4. Does the learner avoid certain age-appropriate activities due to suspected sensory issues?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. Is the learner distracted by sensory stimuli in a way that intrudes with social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

OBSERVATIONAL DATA:

Time	Activity	Sensory Input	Behavior Observed



TARGET GOAL/BEHAVIOR/SKILL:	

IDENTIFY ADDITIONAL EBPS:		
<input type="checkbox"/> Reinforcement (R+)	<input type="checkbox"/> Prompting (PP)	<input type="checkbox"/> Modeling (MD)
<input type="checkbox"/> Task Analysis (TA)	<input type="checkbox"/> Time Delay (TD)	<input type="checkbox"/> Visual Supports (VS)
<input type="checkbox"/> Social Narratives (SN)	<input type="checkbox"/> Video Modeling (VM)	<input type="checkbox"/> _____

MATERIALS:		
1. Developed a session plan for ASI?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Materials for ASI sessions are ready and available?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

ANECDOTAL NOTES:



---Session Components---



Learner's Name: _____ Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill: _____

Directions:

ASI SESSION COMPONENTS:

1.	Trained ASI therapist worked one-on-one with the learner	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2.	Session occurred at the specified meeting time and place	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3.	Therapist ensured physical safety of the learner	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4.	Therapist presented sensory opportunities from at least 2 different modalities (for example, vestibular and proprioceptive)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5.	Therapist helped the child maintain optimal level of alertness for engagement	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6.	Therapist supported and challenged at least one of: postural control, ocular control, and bilateral coordination	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7.	Therapist challenged planning and organization of behavior or series of behaviors	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8.	Therapist collaborated with learner in choosing activities and materials	<input type="checkbox"/> Yes	<input type="checkbox"/> No
9.	Therapist tailored activities to provide "just right" challenges	<input type="checkbox"/> Yes	<input type="checkbox"/> No
10.	Therapist ensured activities are successful	<input type="checkbox"/> Yes	<input type="checkbox"/> No
11.	Therapist supported the learner's intrinsic motivation to play	<input type="checkbox"/> Yes	<input type="checkbox"/> No
12.	Established a therapeutic alliance with the learner	<input type="checkbox"/> Yes	<input type="checkbox"/> No

ANECDOTAL NOTES:



---Generalization Plan---



Learner's Name: _____ Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill (short): _____

Directions: Use this form to plan for supporting generalization of the learner's skills across settings.

GENERALIZATION PLAN:				
Time	Activity	Sensory Input	Behavior Observed	Possible ASI Strategies



---Data Collection---



Learner's Name: _____ Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill: _____

Directions: Collect data on the learner demonstrating the target goal/behavior/skill to determine if the learner is making progress.

MONITORING DATA:

Goal:				
Date	Sensory Stimuli	Behavior Observed	Support Needed	Notes

Prompt Key: V = Verbal; G = Gestural; M = Model; P = Physical; I = No prompts needed/Independent; 0 = No response; MD = Modeling; SN = Social Narratives; TA = Task Analysis; VM = Video Modeling; VS = Visual Support



---Monitoring Progress Checklist---

ASI



Learner's Name: _____

Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill (short): _____

Directions: Complete this checklist to determine if the learner is making progress to the target goal/behavior/skill with this practice.

GENERAL MONITORING:

1. Has the learner achieved the target goal/behavior/skill?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Is the target goal/behavior/skill measurable and observable? Does it clearly state what the target goal/behavior/skill is, when it will occur, and how team members/observers will know it has been mastered?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Is the target goal/behavior/skill too difficult/complex? Does it need to be broken down into smaller steps?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Has enough time been devoted to using this practice (frequency, intensity, and/or duration)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. Was this practice implemented with fidelity?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. Does the learner require additional adaptations/modifications/supports? Such as visual supports or a communication device?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

MONITORING DATA:

Goal:				
Date	Sensory Stimuli	Behavior Observed	Support Needed	Notes



ASI REFLECTION:

1. How do you think that went?

2. Did you encounter any challenges implementing ASI strategies? Yes No

3. Were the activities naturally motivating for the learner, utilizing their natural drive to play? Yes No

4. At which points did you see ASI strategies working?

5. What could you have done differently?

6. Did you feel comfortable implementing the ASI strategies? Yes No

7. Did the learner respond positively to naturally occurring reinforcers? Yes No

8. Did the learner seem to enjoy the activities? Yes No

ANECDOTAL NOTES:

Blank lines for anecdotal notes.

---Step-by-Step Guide---

ASI



This step-by-step practice guide outlines how to plan for, use, and monitor this practice.

BEFORE YOU BEGIN...

Each of the following points is important to address so that you can be sure this selected evidence-based practice is likely to address the target goal/behavior/skill of your learner with autism.

HAVE YOU FOUND OUT MORE INFORMATION ABOUT...?

- Identifying the target goal/behavior/skill...?
- Collecting baseline data through direct observation...?
- Establishing a target goal or outcome that clearly states when the behavior will occur, what the target goal or outcome is, and how team members and/or observers will know when the skill is mastered...?

If the answer to any of the above questions is 'No,' review the process of how to select an appropriate EBP (<https://afirm.fpg.unc.edu/selecting-EBP>).

For more information about this selected evidence-based practice, please visit <https://afirm.fpg.unc.edu/>.

Keep in mind that this selected practice can be used to increase communication, socialization, cognitive and adaptive skills while reducing interfering behaviors in learners with identified challenges in sensory processing.

STEP 1: PLANNING FOR ASI

The planning step details the initial steps and considerations involved to prepare for using this practice with a learner with autism.

1.1 Obtain ASI training

ASI requires training from certified providers. The USC program is presently the only certification program recommended by the American Occupational Therapy Association.

1.2 Determine learner's sensory needs

Conducting an assessment can help you determine the learner's current sensory processing level as well as specific areas of need that the learner may have. This information may be used as part of a referral to a trained OT or as part of an ASI assessment conducted by a trained OT.

📄 *Use the Assessment for ASI Checklist to determine if a learner with autism may benefit from an ASI assessment.*

📄 *Use this Observations Sheet to collect observations on the learner's behaviors.*

1.3 ASI assessment

An ASI Assessment is performed by a certified provider and involves observation of the learner in natural settings, interviews, standardized testing, and structured observations in a clinical setting. Other support staff, including classroom teachers, may support the process by contributing valuable information.

1.4 Develop an ASI session plan

ASI sessions take place one-on-one, on set schedule, and in a clinical setting. Components must be pre-planned and include a variety of sensory opportunities and activities and materials that are intrinsically motivating to the learner.

📄 *Use the ASI Session Plan form to plan for an ASI session for the learner with autism.*

1.5 Identify additional EBPs

It can be helpful to use additional foundational evidence-based practices during ASI sessions to provide needed support to the learner. Modeling, social narratives, task analysis, video modeling and visual supports can be useful in ASI sessions.


1.6 Discuss plan with team members

All members of the learner's school team, including family members, will need to understand the learner's sensory processing challenges and how to implement ASI strategies. Whenever possible, include the learner as a leader of their own support team.

STEP 1: PLANNING FOR ASI (CONTINUED)

1.7 Have materials ready and available

Verify that all the materials are ready and space for teaching is available. Materials should include:

- the individual ASI session plan
 - prepared materials for their sensory activities and opportunities to be addressed in the ASI session
 - data collection forms
 - any other EBP supports you have decided to use
-  *Use the Planning Checklist to determine if ready to use ASI.*


STEP 2: USING ASI

This step details the process of implementing this practice with a learner with autism.

2.1 Address the ASI session goals

Some essential components of an ASI therapy session as implemented by a trained therapist include:

- a sensory experience
- a response to a challenge
- an enriched physical environment
- the context of play
- the therapeutic alliance (the trusting relationship between the therapist and learner).

 *Use the ASI Session Fidelity Checklist to determine if ASI is being used with fidelity.*

2.2 Use other EBPs to support ASI sessions

Visual supports and modeling are commonly implemented as part of ASI sessions to make expectations clear to the learner.

2.3 Promote generalization of learner's target skills

Generalizing the learner's positive sensory experiences in therapy to home, school, and community settings is a process that includes:

- regular communication with the learner's team
- team collaboration to adapt environments meet the learner's sensory needs
- establishing consistent responses to the learner's behaviors
- involving learners in plans to generalize their skills

 *Use the ASI Generalization Plan to support generalization of the learner's skills across settings.*


STEP 3: MONITORING ASI

The following step details how to monitor the use of this practice with a learner with autism and how to determine next steps based on the data.

3.1 Collect and analyze data

It is important to continuously collect and review data with the ASI team. Collect data on:

- setting of observation
- sensory experiences available in the setting by modality
- learner's response to sensory stimuli
- level of prompting needed for learner to participate in that sensory setting
- other EBPs or strategies used to support the learner

 *Use the Data Collection Form to collect data and monitor learner progress toward ASI goals.*

3.2 Determine next steps based on learner progress

Collecting data will help team members decide about the effectiveness of using this practice and whether the learner with autism is making progress. If a learner is making progress based upon data collected, team members should continue to use the selected strategies.

If team members determine that the learner is not making progress, consider the following:

- Have team members received ASI training or is additional training needed?
- Is the target goal/behavior/skill well defined?
- Is the target goal/behavior/skill measurable and observable?
- Has enough time been devoted to using this practice (frequency, intensity, and/or duration)?
- Is the target goal/behavior/skill being targeted during appropriate routines and activities?
- Is ASI appropriate or a 'good fit' for the target behavior?
- Are ASI strategies addressing the target behavior?
- Does the learner need additional supports?
- Are the selected materials and activities intrinsically motivating for the learner?

If these issues have been addressed and the learner with autism continues not to show progress, consider selecting a different evidence-based practice to use with the learner with autism.



---Implementation Checklist---

ASI

		Observation:				
		1	2	3	4	5
		Date:				
Observer's initials:						
STEP 1: PLANNING						
<p>Before you start, have you...?</p> <p><input type="checkbox"/> Identified the target goal/behavior/skill?</p> <p><input type="checkbox"/> Collected baseline data through direct observation?</p> <p><input type="checkbox"/> Established a target goal or outcome that clearly states when the behavior will occur, what the target goal or outcome is, and how team members and/or observers will know when the skill is mastered?</p> <p>If the answer to any of the above questions is 'No,' review the process of how to <u>select an EBP.</u></p>	1.1	Obtain ASI training from a licensed provider				
	1.2	Determine learner's sensory needs				
	1.3	Conduct an ASI Assessment				
	1.4	Develop an ASI session plan				
	1.5	Identify additional EBPs				
	1.6	Discuss plan with team members				
	1.7	Have materials ready and available				
STEP 2: USING						
	2.1	Address the ASI session goals				
	2.2	Use other EBPs to support ASI sessions				
	2.3	Promote generalization of learner's target skills				
STEP 3: MONITORING						
	3.1	Collect and analyze data				
	3.2	Determine next steps based on learner progress				

---Tip Sheet for Professionals---

ASI

AYRES SENSORY INTEGRATION® IS...

- An evidence-based practice that targets a learner's ability to process and internally integrate sensory information from their body and the environment.
- Ayres Sensory Integration® is the only type of sensory integration therapy with an evidence base.
- Used to increase a target goal/behavior/skill and/or to decrease an interfering/inappropriate/challenging behavior



WHY USE WITH LEARNERS WITH AUTISM?

- About 56% to 70% (Baranek, David, Poe, Stone, & Watson, 2006; Ben-Sasson et al., 2007) of learners with autism are estimated to have sensory processing challenges.
- ASI can help learners with autism regulate their bodies and process sensory information so that they can complete daily activities. Learners may benefit from ASI to support fine and gross motor skills, adaptive skills, communication and socialization skills, and emotion regulation.

TIPS:

- Training in ASI is necessary to become proficient with using ASI.
- Determine the learner's current sensory processing level to decide whether an ASI assessment would be beneficial.
- Additional EBPs can be used to support learners during ASI sessions.

INSTRUCTIONAL OUTCOMES:

- The evidence-base for this practice supports its use to address the following outcomes, according to age range, in the table below:

EVIDENCE-BASE:							
	ACADEMIC	ADAPTIVE	CHALLENGING	COGNITIVE	COMMUNICATION	MOTOR	SOCIAL
3-5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6-11	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12-14			Yes			Yes	Yes



STEPS FOR IMPLEMENTING:

1. PLAN

- Obtain ASI training from a licensed provider
- Determine learner's sensory needs
- Conduct an ASI Assessment
- Develop an ASI session plan
- Identify additional EBPs
- Discuss plan with team members
- Have materials ready and available

2. USE

- Address the ASI session goals
- Use other EBPs to support ASI sessions
- Promote generalization of learner's target skills

3. MONITOR

- Collect data and analyze data
- Determine next steps based on learner progress

Ayres Sensory Integration (R) ASI

This sheet was designed as a supplemental resource to provide basic information about this evidence-based practice for professionals working with learners with autism.

For more information about this selected evidence-based practice, please visit <https://afirm.fpg.unc.edu/>.

---Parent's Guide---

ASI



Ayres Sensory Integration (R) ASI

This parent introduction to ASI was designed as a supplemental resource to help answer questions about this practice.

To find out more about how this ASI is being used with your child, please talk with:

For more information about this selected evidence-based practice, please visit <https://afirm.fpg.unc.edu/>.

WHAT IS ASI?

- An evidence-based practice that targets a learner's ability to process and internally integrate sensory information from their body and the environment.
- Ayres Sensory Integration® is the only type of sensory integration therapy with an evidence base.
- Used to increase a target goal/behavior/skill and/or to decrease an interfering/inappropriate/challenging behavior

WHY USE THIS ASI WITH MY CHILD?

- Research studies have shown ASI has been used effectively with learners with autism from preschool through high school.
- ASI can help learners with autism regulate their bodies and process sensory information so that they can complete daily activities.
- ASI can be used to support fine and gross motor skills, adaptive skills, communication and socialization skills, and emotion regulation.

WHAT ACTIVITIES CAN I DO AT HOME?

ASI strategies and activities at home are most effective when used in collaboration with a certified ASI therapist (usually an Occupational Therapist). Here are some examples:

- Create a quiet, calming space in the home. Provide comfortable seating like a bean bag chair, soft cushions, or pillows. Offer soothing activities, calming music or sounds, or other pleasing sensory stimulation in this space.
- Provide a series of movement-based activities for your child to participate in on a regular basis. A visual sequence, or picture cues, can guide your child to engage in activities such as swinging, jumping, balancing, and climbing.
- To address tactile needs, provide deep pressure using a weighted blanket or squeezing hands. Encourage play that involves a variety of materials like sand, water, finger paint or playdough.

---Additional Resources---





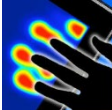
ASI



Check out these resources, applications, books, and websites, to support your use of this evidence-based practice.

For more information about this selected evidence-based practice, please visit <https://afirm.fpg.unc.edu/>.

APPLICATIONS:

Developer	Available	Pricing
 Sensational Brain, LLC <i>Brain Works</i>	Mac App Store	\$13.99
 TriggerWave, LLC <i>Pocket Pond 2</i>	Mac App Store	Free
 HAUS K. K. <i>Dropophone</i>	Mac App Store	Free
 Seebz, LLC <i>Miracle Modus</i>	Mac App Store	Free
 Padadaz <i>Heat Pad- Relaxing Surface</i>	Mac App Store	Free

BOOKS:

Ayres, A. J. (2005). *Sensory integration and the child*. Western Psychological Services.

Ayres, A. J., Erwin, P. R., & Mailloux, Z. (2004). *Love, Jean: Inspiration for families living with dysfunction of sensory integration*. Crestport Press.

Bundy, A. C., & Lane, S. J. (2019). *Sensory integration: Theory and practice*. F. A. Davis Company.

Schaaf, R. C., & Mailloux, Z. M. (2015). *Clinician's guide for implementing Ayres Sensory Integration: Promoting participation for children with autism*. AOTA Press.

Smith Roley, S., Schaaf, R. C. (2006). *Sensory integration: Applying clinical reasoning to practice with diverse populations*. Pro-Ed.



WEBSITES:

Sensory Integration Global Network <https://www.siglobalnetwork.org>

USC Chan Division of Occupational Science and Occupational Therapy
<https://chan.usc.edu/academics/continuing-education/sensory-integration>

OTHER RESOURCES:

Ayres, A. J. (1989). *The sensory integration and praxis test (SIPT)*. Western Psychological Services.

---Glossary---

ASI



Below are the key terms that apply specifically to this evidence-based practice.

For more information about this selected evidence-based practice, please visit <https://afirm.fpg.unc.edu/>.

Activities of daily living (ADLs)

everyday skills required to care for oneself including skills related to hygiene, feeding and mobility

Ayres Sensory Integration®

an evidence-based practice that used to increase student communication, socialization, cognitive, and adaptive skills while reducing challenging behaviors in learners.

Baseline data

information gathered from multiple sources to better understand the target behavior, before using an intervention or practice; data collected on current performance level prior to implementation of intervention

Cognitive flexibility

the ability to adapt thinking and behavior in response to new, changing, or unplanned stimuli the environment

Executive functioning

a set of mental skills that involve planning, monitoring, and executing goals

Fidelity

how well and how often the implementation steps for an evidence-based practice are followed

Generalization

the ability to use learned skills in new and different environments

Gustatory

referring to the sense of taste



Implementation checklist

the specific steps needed to accurately follow an evidence-based practice.

Interfering behavior

is a challenging behavior that interferes with the learner's ability to learn

“Just Right” Challenge

A core feature of ASI treatment sessions where the therapist creates a task that challenges the learner just beyond their current skill or comfort level to progress toward a goal without overly frustrating the learner

Modeling

an evidence-based practice that involves the learner observing someone correctly performing a target behavior

Natural reinforcer

a reward that occurs as a result of the learner's behavior

Naturalistic intervention

an evidence-based practice that integrates the principles of applied behavior analysis (ABA) into the natural environment or into a learner's everyday routines and activities

Norm referenced score

a score on a test or assessment that compares the learner's performance to that of other students taking the test

Olfactory

referring to the sense of smell

Prompting

an evidence-based practice that will assist the learner in using specific skills; prompts can be verbal, gestural, or physical

Proprioceptive

relating to the sense of body awareness, location, and movement

Reinforcement

an evidence-based practice that provides feedback that increases the use of a strategy or target behavior/skill



Sensory processing dysfunction

difficulty processing and responding to information from the senses and

Social narratives

an evidence-based practice used to describe social situations and appropriate behavior expectations for learners with autism

Task analysis

a foundational evidence-based practice used to teach target skills and increase desired behavior by breaking down skills and teaching chained behaviors

Team members

includes the parents, other primary caregivers, IEP/IFSP team members, teachers, therapists, early intervention providers, and other professionals involved in providing services for the learner with autism

Therapeutic alliance

The trusting relationship established between the learner and therapist in order for ASI treatment to be successful, particularly during “just right” challenges

Vestibular

referring to the body's sense of balance and movement

Visual Supports

an evidence-based practice that provides concrete cues that are paired with, or used in place of, a verbal cue to provide the learner with information about a routine, activity, behavioral expectation, or skill demonstration

Working memory

the ability to mentally hold and use information over a short period of time

---References---

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Listed below, in numerical order, are the references used in the module.

For more information about this selected evidence-based practice, please visit <https://afirm.fpg.unc.edu/>.

1. Nowell, S. A., Szendrey, S., Steinbrenner, J. R., Hume, K., & Odom, S. O. (2021). *Sensory Integration: A companion to the NCAEP report*. The University of North Carolina, Frank Porter Graham Child Development Institute, National Professional Development Center on ASD. https://ncaep.fpg.unc.edu/sites/ncaep.fpg.unc.edu/files/resources/Sensory%20Integration_A%20Companion%20to%20the%20NCAEP%20Report.pdf
2. Baranek, G. T., David, F. J., Poe, M. D., Stone, W. L., & Watson, L. R. (2006). Sensory Experiences Questionnaire: discriminating sensory features in young children with autism, developmental delays, and typical development. *Journal of Child Psychology and Psychiatry*, 47(6), 591-601.
3. Ben-Sasson, A., Cermak, S. A., Orsmond, G. I., Tager-Flusberg, H., Carter, A. S., Kadlec, M. B., & Dunn, W. (2007). Extreme sensory modulation behaviors in toddlers with autism spectrum disorders. *American Journal of Occupational Therapy*, 61(5), 584-592.
4. Ahn, R. R., Miller, L. J., Milberger, S., & McIntosh, D. N. (2004). Prevalence of parents' perceptions of sensory processing disorders among kindergarten children. *American Journal of Occupational Therapy*, 58(3), 287-293.
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7. Pfeiffer, B. A., Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, L. (2011). Effectiveness of sensory integration interventions in children with autism spectrum disorders: A pilot study. *The American Journal of Occupational Therapy*, 65(1), 76-85. <https://doi.org/10.5014/ajot.2011.09205>
8. Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., van Hooydonk, E., Freeman, R., Leiby, B., Sendekki, J., & Kelly, D. (2014). An intervention for sensory difficulties in children with autism: A randomized trial. *Journal of Autism and Developmental Disorders*, 44(7), 1493-1506. <https://doi.org/10.1007/s10803-013-1983-8>



9. Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., Van Hooydonk, E., ... & Kelly, D. (2014). An intervention for sensory difficulties in children with autism: A randomized trial. *Journal of Autism and Developmental Disorders, 44*(7), 1493-1506.
10. 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.
<http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/imce/documents/2014-ASI-Report.pdf>
11. Hunt, J., van Hooydonk, E., Faller, P., Mailloux, Z., & Schaaf, R. (2017). Manualization of occupational therapy using Ayres Sensory Integration® for autism. *OTJR: Occupation, participation and health, 37*(3), 141-148.
12. Schaaf, R. C. (2015). "Clinician's guide for implementing Ayres Sensory Integration: promoting participation for children with autism" *Jefferson Faculty Books*. 93.
<https://jdc.jefferson.edu/jeffersonfacultybooks/93>
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14. American Occupational Therapy Association. (2006). Policy 1.44: Categories of occupational therapy personnel. In Policy manual (2013 ed., pp. 32-33). Bethesda, MD: Author.
15. Smith Roley, S., Schaaf, R. C. (2006). Sensory integration: Applying clinical reasoning to practice with diverse populations. Pro-Ed.
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17. Parham, L. D., Roley, S. S., May-Benson, T. A., Koomar, J., Brett-Green, B., Burke, J. P., ... & Schaaf, R. C. (2011). Development of a fidelity measure for research on the effectiveness of the Ayres Sensory Integration® intervention. *American Journal of Occupational Therapy, 65*(2), 133-142.

---CEC Standards---

ASI



Below are the CEC Professionals Standards that apply specifically to Ayres Sensory Integration® (ASI).

The CEC Standards that apply to all 28 evidence-based practices (EBPs) can be found on our website at <https://afirm.fpg.unc.edu/>.

Initial Practice-Based Standards for Early Interventionists/Early Childhood (0-5 years; CEC, 2020)

STANDARD 4: ASSESSMENT PROCESSES

4.2 Develop and administer informal assessments and/or select and use valid, reliable formal assessments using evidence-based practices, including technology, in partnership with families and other professionals.

4.4 Candidates, in collaboration with families and other team members, use assessment data to determine eligibility, develop child and family-based outcomes/goals, plan for interventions and instruction, and monitor progress to determine efficacy of programming.

STANDARD 5: APPLICATION OF CURRICULUM FRAMEWORKS IN THE PLANNING OF MEANINGFUL LEARNING EXPERIENCE

5.1 Collaborate with families and other professionals in identifying an evidence-based curriculum addressing developmental and content domains to design and facilitate meaningful and culturally responsive learning experiences that support the unique abilities and needs of all children and families.

STANDARD 6: USING RESPONSIVE AND RECIPROCAL INTERACTIONS, INTERVENTIONS, AND INSTRUCTION

6.1 In partnership with families, identify systematic, responsive, and intentional evidence-based practices and use such practices with fidelity to support young children's learning and development across all developmental and academic content domains.

6.3 Engage in ongoing planning and use flexible and embedded instructional and environmental arrangements and appropriate materials to support the use of interactions, interventions, and instruction addressing developmental and academic content domains, which are adapted to meet the needs of each and every child and their family.

6.4 Promote young children's social and emotional competence and communication, and proactively plan and implement function-based interventions to prevent and address challenging behaviors.



STANDARD 6: USING RESPONSIVE AND RECIPROCAL INTERACTIONS, INTERVENTIONS, AND INSTRUCTION (CONTINUED)

6.6 Candidates use responsive interactions, interventions, and instruction with sufficient intensity and types of support across activities, routines, and environments to promote child learning and development and facilitate access, participation, and engagement in natural environments and inclusive settings.

6.7 Plan for, adapt, and improve approaches to interactions, interventions, and instruction based on multiple sources of data across a range of natural environments and inclusive settings.

STANDARD 7: PROFESSIONALISM AND ETHICAL PRACTICE

7.2 Engage in ongoing reflective practice and access evidence-based information to improve own practices.

Initial Practice-Based Standards for Grades K-12 (CEC, 2020)

STANDARD 2: UNDERSTANDING AND ADDRESSING EACH INDIVIDUAL'S DEVELOPMENTAL AND LEARNING NEEDS

2.1 Apply understanding of human growth and development to create developmentally appropriate and meaningful learning experiences that address individualized strengths and needs of students with exceptionalities.

STANDARD 4: USING ASSESSMENT TO UNDERSTAND THE LEARNER AND THE LEARNING ENVIRONMENT FOR DATA-BASED DECISION MAKING

4.1 Collaboratively develop, select, administer, analyze, and interpret multiple measures of student learning, behavior, and the classroom environment to evaluate and support classroom and school-based systems of intervention for students with and without exceptionalities.

4.3 Assess, collaboratively analyze, interpret, and communicate students' progress toward measurable outcomes using technology as appropriate, to inform both short- and long-term planning, and make ongoing adjustments to instruction.

STANDARD 5: SUPPORTING LEARNING USING EFFECTIVE INSTRUCTION

5.2 Use effective strategies to promote active student engagement, increase student motivation, increase opportunities to respond, and enhance self-regulation of student learning.

5.3 Use explicit, systematic instruction to teach content, strategies, and skills to make clear what a learner needs to do or think about while learning.





STANDARD 5: SUPPORTING LEARNING USING EFFECTIVE INSTRUCTION (CONTINUED)

5.6 Plan and deliver specialized, individualized instruction that is used to meet the learning needs of each individual.

STANDARD 6: SUPPORTING SOCIAL, EMOTIONAL, AND BEHAVIORAL GROWTH

6.2 Use a range of preventive and responsive practices documented as effective to support individuals' social, emotional, and educational well-being.

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6.3 Candidates systematically use data from a variety of sources to identify the purpose or function served by problem behavior to plan, implement, and evaluate behavioral interventions and social skills programs, including generalization to other environments.

STANDARD 7: COLLABORATING WITH TEAM MEMBERS

7.2 Candidates collaborate, communicate, and coordinate with families, paraprofessionals, and other professionals within the educational setting to assess, plan, and implement effective programs and services that promote progress toward measurable outcomes for individuals with and without exceptionalities and their families.

Advanced Practice-Based Standards (CEC, 2012)

STANDARD 1: ASSESSMENT

1.2 Design and implement assessments to evaluate the effectiveness of practices and programs.

STANDARD 2: CURRICULAR CONTENT KNOWLEDGE

2.2 Continuously broaden and deepen professional knowledge and expand expertise with instructional technologies, curriculum standards, effective teaching strategies, and assistive technologies to support access to and learning of challenging content.

STANDARD 3: PROGRAMS, SERVICES, AND OUTCOMES

3.1 Design and implement evaluation activities to improve programs, supports, and services for individuals with exceptionalities.

3.4 Use instructional and assistive technologies to improve programs, supports, and services for individuals with exceptionalities.