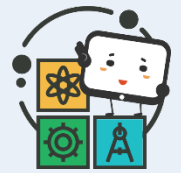


# A GUIDE TO ADAPTATIONS

At STEMIE, we use adaptations to ensure each and every child, including young children with disabilities can fully participate and engage in STEM (science, technology, engineering, and math) learning opportunities and experiences at home, in early childhood programs, and in the community.



Every child is different, and these are only suggested adaptations. Do what works best for the child or children you are working with. You might also work with children's speech pathologist or occupational therapist to develop additional adaptations or visual cues.

In this document, we define and describe an evidence-based inclusion framework and provide definitions and examples of adaptations that adults can use to ensure young children with disabilities can participate fully in STEM learning experiences.

## Inclusion Framework

The inclusion framework is informed by evidence-based inclusive practices (e.g., Campbell & Milbourne, 2007; DEC, 2014) and focuses on the supports adults can implement to facilitate STEM learning for children with disabilities.

## Hierarchy of adaptations

Within the hierarchy, adaptations to the environment and materials are aligned to the Division for Early Childhood (DEC) Recommended Practices on environment while instructional adaptations are aligned to the Recommended Practices on instruction.

1. Environment - Environmental, activity, and/or routine adaptations are broad changes and/or accommodations in the setting and/or activity that support inclusive access to learning opportunities, embed interventions, and support full participation and independence for all children (e.g., room set-up, equipment, how an activity is done, length of time).
2. Materials - Materials adaptations are changes and/or accommodations to materials that support inclusive access to learning opportunities, embed



interventions, and support full participation and independence for all children (e.g., adaptations to toys, materials, assistive technology devices).

3. Instruction – Instructional adaptations are changes and/or accommodations to the instruction or teaching that support inclusive access to learning opportunities, embed interventions, and support full participation and independence for all children (e.g., add information, reduce steps).

The parameters of the framework are that 1) adaptations are not disability-specific, 2) adaptations can be used across all settings and be embedded in children’s everyday routines and activities, and 3) adults should start with children’s interests and preferences, and work to maximize children’s strengths to promote positive and active learning experiences.

## What are adaptations?

Adaptations are practices used by adults (e.g., family members, practitioners) to facilitate and/or individualize STEM learning and experiences within daily routines and the environment. Specifically, adaptations are changes to the environment, activities, routines, materials, and/or instruction, while minimizing adult assistance (Campbell, Milbourne, & Kennedy, 2012).

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## ENVIRONMENT

# Area & Space

Arrange the environment and/or materials in a systematic way for a specific purpose



**Add rails to stools**

*Image credit: CONNECT Module 1, 2009*



**Tape placemats for mealtime routines**

*Image credit: CONNECT Module 1, 2009*



**Arrange the room to allow for in/out and turning for wheelchairs and walkers (at least 3 ft width)**

*Image credit: Creative Commons*



**Use modified seating and standing options so that all children are on the same level (e.g., stander at water table, floor-level support seat for group time, cube chair, chair with bumpers) that are sturdy**

*Image credit: CONNECT Module 1, 2009, Feeding Littles*



**Cover materials not needed for an activity**

*Image credit: Creative Commons*



**Limit background noise & distractions (have a quiet area)**

*Image credit: Creative Commons*



## ENVIRONMENT

# Within Reach

Arrange materials in a contained space for easier access



Extend fixtures (i.e., extend faucet handle with pliers or tubing)

*Image credit: CONNECT Module 1, 2009*



Place toys and materials at eye level in open containers with labels

*Image credit: Parma Preschool*



Use low, open shelves and tables that are at comfortable heights

*Image credit: Creative Commons*



Use trays, cookie sheets, or short bins for manipulatives, games, and/or puzzles

*Image credit: Creative Commons, BRIDGES Activities, 2021*



## MATERIALS

# Assistive Technology

Use of “any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities”  
(Sandall et al., 2005)



Use big button switch to make an object do something specific (e.g., make gears spin on a toy, turn on a radio)

*Image credit: CONNECT Module 1, 2009*



Use specialized technology (e.g., specialized toys/computers with switches, powered wheelchairs)

*Image credit: Creative Commons*



Use voice output to ‘say’ a simple phrase like ‘more, please’

*Image credit: CONNECT Module 1, 2009*





## MATERIALS

# Grasping Supports

Add additional material(s) to an object to make it easier to grasp, lift, or turn



Add a Styrofoam ball to pencils, crayons, and or paintbrushes for easier grasping or use wide handles

*Image credit: Pinterest, BLICK Art Supplies*



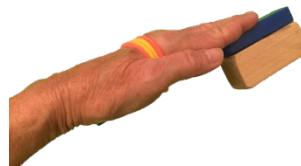
Add grip tape or silicone bands to handles or use wide utensils for easier grasping

*Image credit: Creative Commons, EazyHold Store*



Add page fluffers to book pages for easier turning (See How-To Guide for Storybook Conversations for more information & ideas)

*Image Credit: Paths to Literacy, 2018*



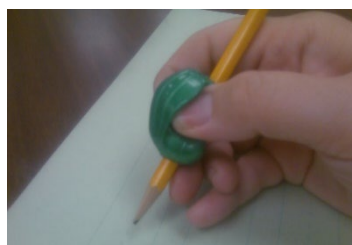
Add Velcro or magnets to toys and materials and use a Velcro wrist band or a magnet grasper to make it easier to pick up materials and toys

*Image credit: Creative Commons, BRIDGES Activities, 2021*



Glue empty thread spools, knobs, or t-plumbing pipes to blocks and/or puzzles pieces for easier grasping

*Image credit: Simmons-Martinez, 2007*



Use alternative materials (e.g., soft, squeezable) to support grasping

*Image credit: Creative Commons*



## MATERIALS

# Grasping Supports (Continued)

Add additional material(s) to an object to make it easier to grasp, lift, or turn



Use cups with handles

*Image credit: Creative Commons*



Use deep bowls/plates for easier scooping

*Image credit: Creative Commons*



Use non-skid mats (i.e., Velcro, rubber shelf liners) to keep toys and materials in place and within reach

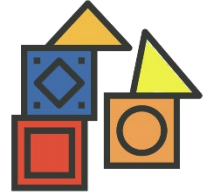
*Image credit: Creative Commons*



## MATERIALS

# Variety of Materials

Provide a variety of materials of different sizes, shapes, colors, and/or textures to increase interest and accessibility



Create prop/story boxes (e.g., items/objects related to the books or theme) for books to increase engagement and understanding

*Image Credit: Paths to Literacy, 2018*



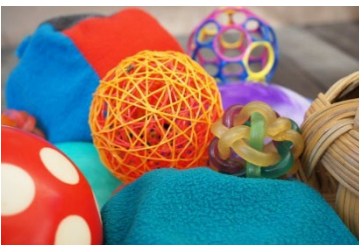
Use alternative materials to support grasping (e.g., soft, squeezable; see Grasping Supports for more examples)

*Image credit: Creative Commons*



Use high contrast materials (e.g., puzzles, shapes) for visual discrimination

*Image credit: Creative Commons*



Use materials or toys that are a mix of different sizes, colors and/or textures

*Image credit: Creative Commons*



Use materials or toys that stack or interlock easily (magnetic tiles, bristle blocks)

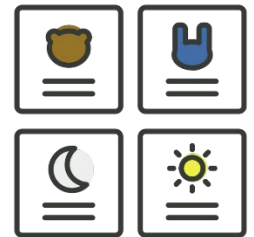
*Image credit: Creative Commons*



MATERIALS

# Visual Supports

Add to and/or visually modify an object or material to increase interest



Add child's name and/or picture of the child

Image credit: A How-To Guide for Adaptations to Storybooks, 2020



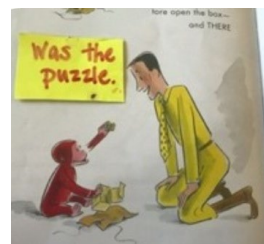
Create prop/story boxes (e.g., items/objects related to the books or theme) for books to increase engagement and understanding

Image Credit: Paths to Literacy, 2018



Add colored borders to focus attention

Image credit: Infopeople



Simplify book text (See How-To Guide for Storybook Conversations for more information & ideas)

Image credit: A How-To Guide for Adaptations to Storybooks, 2020



Add tactile outlines to book illustrations

Image credit: PACER Simons Center on Technology



Use concrete objects or visuals for participation (e.g., a number chart or small objects a child and/or teacher can point to while counting)

Image credit: Creative Commons



Create picture cards of key words/ideas for books

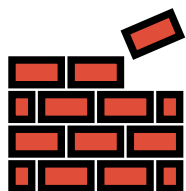
Image credit: CONNECT Module 1, 2009



INSTRUCTION

## Support for Communication

Use a variety of methods of communication (e.g., sign language, gestures) to meaningfully engage children



Build vocabulary by using and defining words (e.g., you chose a red block; you put that on top)



Narrate children's actions (e.g., counting, building, waterplay)



Repeat and extend interactions, activities, and children's words



Speak slowly and clearly and ensure the child can see you during activities and songs



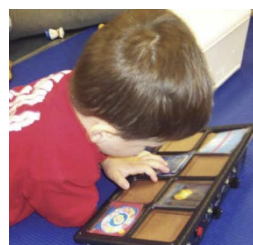
Support use of a communication book

*Image credit: Creative Commons*



Support use of communication devices (see Assistive Technology for more examples)

*Image credit: Creative Commons*



Use First/Then board or a choice board

*Image credit: CONNECT Module 1, 2009*



Use sign language and/or gestures in conjunction with spoken words

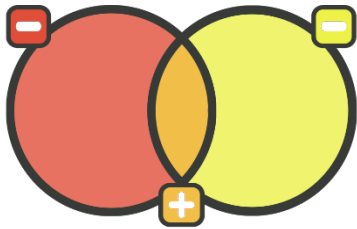
*Image credit: Creative Commons*



INSTRUCTION

# Visual Cues

Use pictures and/or icons to signal next steps



Add a graphic organizer to aid comprehension

*Image credit: STEMIE*



Use First/Then board

*Image credit: Creative Commons*



Create a visual schedule with predictable daily routines & activities

*Image credit: Creative Commons*



Use prompt cards (e.g., pictures of activities and centers)

*Image credit: Creative Commons*



Use a choice board

*Image credit: Creative Commons*



Use visuals that clearly illustrate the activity

*Image credit: Creative Commons*



Use concrete objects to represent schedule (see Visual Schedules)

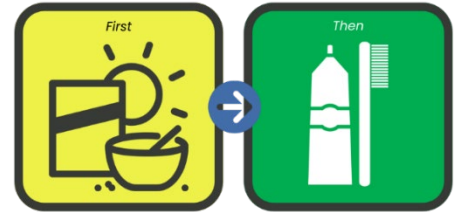
*Image credit: SimplifyTheChaos.com*



## INSTRUCTION

# Visual Schedules

Use a picture and/or icon list with words for transitions and routines to provide structure and predictability



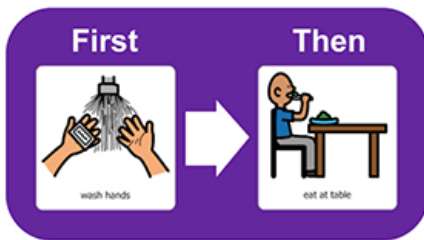
Create a class schedule

*Image credit: Creative Commons*



Create a visual schedule with predictable daily routines & activities

*Image credit: Creative Commons*



Use a First/Then board (see also Visual Cues)

*Image credit: Creative Commons*

	Washing hands
	Water on
	Hands wet
	Rub hands with soap
	Rinse
	Water off
	Dry

Use task analysis

*Image credit: Creative Commons*



## INSTRUCTION

# Teaching Practices

Some young children may require additional instructional supports, such as teaching strategies/practices, from adults and/or peers to successfully engage in STEM learning



opportunities and experiences. For more information about teaching practices listed below, see [A Guide to Teaching Practices](#).

- Allow time for independent response
- Engage with children in a positive encouraging manner
- Give reinforcement
- Limit the number of children participating in an activity
- Model exploration and play
- Modify an activity (shorten, extend, break into steps, add movement)
- Pair children together
- Provide prompts (visual cues, hand-over-hand/physical, gestural, model, verbal, scaffold)
- Take turns with children
- Understand that children are engaging in purposeful play & learning
- Use descriptive talking/verbal guidance
- Wait for children to initiate interactions and activities and follow their lead and interests