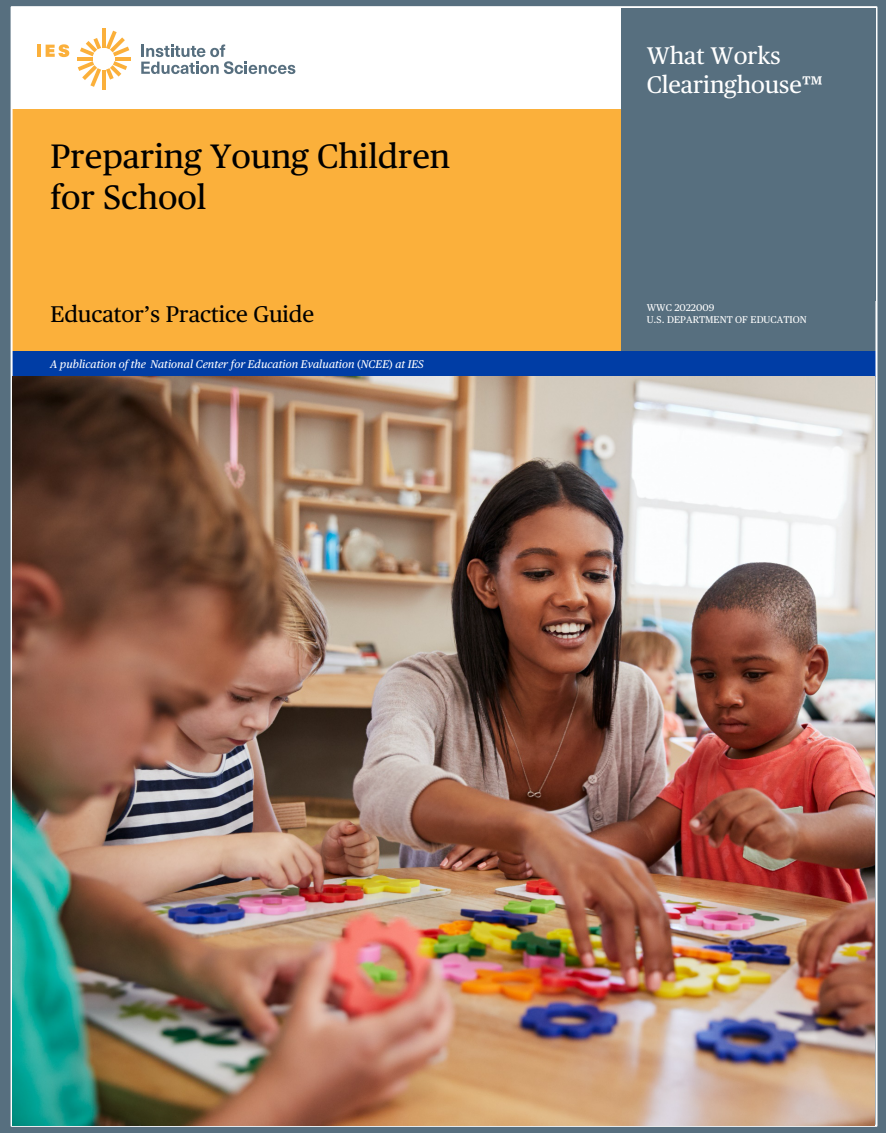
What Works Clearinghouse Practice Guide on *Preparing Young Children for School*



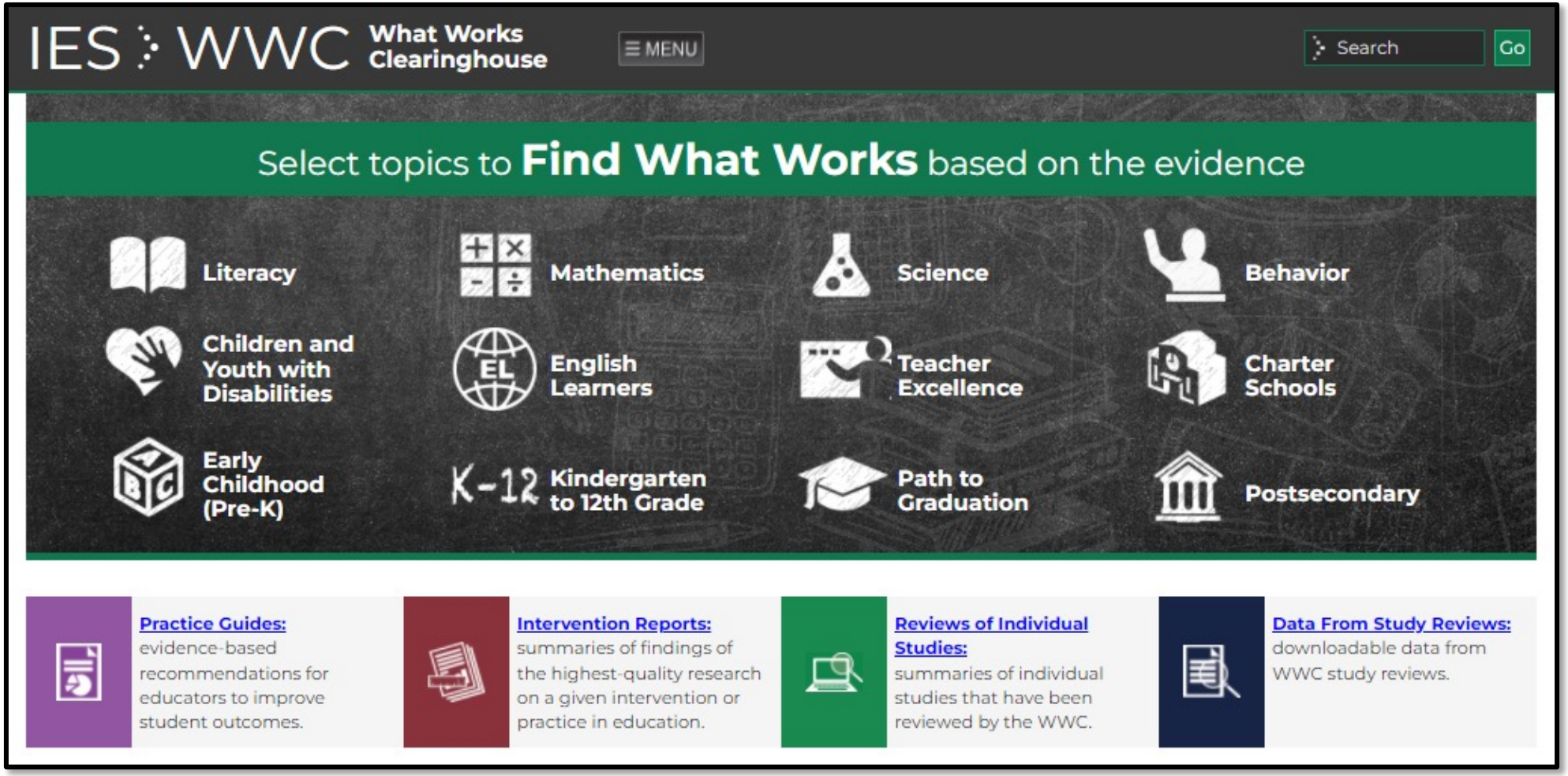
IES Institute of Education Sciences

Expert Panel

- Margaret Burchinal (Chair), *University of Virginia*
- Karen Bierman, *Penn State University*
- Jorge Gonzalez, *University of Houston*
- Megan McClelland, *Oregon State University*
- Kimberly Nelson, *Rockford Public Schools*
- Jill Pentimonti, *University of Notre Dame*
- David Purpura, *Purdue University*
- Jason Sachs, *Boston Public Schools*
- Julie Sarama, *University of Denver*
- Elizabeth Schlesinger-Devlin, *Purdue University*
- Julie Washington, *University of California, Irvine*

Introduction

What Works Clearinghouse (https://whatworks.ed.gov/)



Who Might Find This Guide Useful

- Educators working in preschool classrooms
- Personnel supervising teachers and overseeing educational practices for preschool programs
- Center and program directors, educational coordinators, as well as district or state personnel involved in adopting curricula for preschool programs
- Parents and caregivers seeking to help children

Levels of Evidence

Strong: There is consistent evidence that meets WWC standards and indicates that the practices improve outcomes for a diverse student population.

Moderate: There is some evidence meeting WWC standards that the practices improve student outcomes, but there may be ambiguity about whether that improvement is the direct result of the practices or whether the findings can be replicated with a diverse population of students.

There is also a **Minimal** level of evidence, which was not needed for this guide.

Recommendations and Corresponding Levels of Evidence

Practice recommendation	Level of evidence		
	Minimal	Moderate	Strong
1. Regularly provide intentional, engaging instruction and practice focused on social-emotional skills.			✓
2. Strengthen children's executive function skills using specific games and activities.		✓	
3. Provide intentional instruction to build children's understanding of mathematical ideas and skills.			✓
4. Engage children in conversations about mathematical ideas and support them in using mathematical language.		✓	
5. Intentionally plan activities to build children's vocabulary and language.			✓
6. Build children's knowledge of letters and sounds.			✓
7. Use shared book reading to develop children's language, knowledge of print features, and knowledge of the world.			✓

Overarching Themes

- **The importance of intentional instruction:** Teachers should set up lessons to intentionally help children learn a skill or concept.
- **The importance of interaction and conversation:** Children can learn more from conversing with the teacher.
- **The importance of lessons building sequentially:** New learning should proceed in a deliberate and systematic order, from easy to more difficult skills and concepts.

Overarching Themes (continued)

- **The importance of scheduling time for intentional learning:** Develop a schedule in which intentional instruction time is devoted to social-emotional learning, executive function, mathematics, and literacy.
- **The importance of recognizing everyone's backgrounds and experiences:** Preschools should reflect and value the cultural, racial, and linguistic backgrounds of the children, teachers, and community.

Recommendation 1: *Regularly provide intentional, engaging instruction and practice focused on social-emotional skills.*

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How-to Step 1: Follow a curriculum that promotes incremental social-emotional learning.

How-to Step 2: Intentionally devote time to teach social-emotional skills in an engaging way.

How-to Step 3: Plan staged activities for children to practice social-emotional skills.

How-to Step 4: Take advantage of naturally occurring situations to reinforce and review social-emotional skills.

How-to Step 5: Inform parents, caregivers, and guardians about the social-emotional skills children are learning so skills can be practiced and reinforced at home.

Targeted Social-Emotional Skills

- Identifying and understanding one's feelings
- Accurately reading and comprehending emotional states in others
- Regulating one's behavior
- Managing strong emotions and their expression constructively
- Developing empathy for others
- Establishing and sustaining relationships

Source: Illinois Early Learning and Developmental Standards

How-to Step 1: *Follow a curriculum that promotes incremental social-emotional learning.*

- The curriculum should have a scope and sequence and address instruction in social-emotional skills incrementally.
- Start at a point in the sequence that is appropriate for the ages and developmental needs of the children in the classroom.
- Consider cultural differences in the ways children learn to express and regulate their emotions.

Sources for locating evidence-based curricula for social-emotional development

1. **Collaborative for Academic, Social, and Emotional Learning (CASEL)**
2. **Blueprints for Healthy Youth Development**
3. **What Works Clearinghouse**

How-to Step 2: *Intentionally devote time to teach social-emotional skills in an engaging way.*

- Set aside 10–20 minutes to teach social-emotional skills 1–2 times per week.
- Offer time throughout the week to practice the skills.
- Teach a new social-emotional lesson in a brief and engaging way to capture children's attention.
- Stories, puppet shows, or brief role-plays expose children to many different experiences and interactions.
- Provide children with vocabulary and phrases they can use to manage their feelings and communicate with others.

How-to Step 3: *Plan staged activities for children to practice social-emotional skills.*

- Prepare staged activities that will provide structured opportunities for children to practice what they are learning, rather than waiting for learning opportunities that naturally occur during playtime.
- Carefully plan and script staged activities in advance.
- Reinforce children's learning by providing them with feedback during the staged activities to help them recognize when they are correctly using their new social-emotional skills.

Source: National Center for Pyramid Model Innovations (NCPMI) Teaching Tools for Young Children

Example: *Staging activities to repeatedly practice and reinforce a skill.*

Asking for Help

1. Role-play a scenario of frustration and ask another adult for help to review the concept of asking for help.
2. Role-play a scenario of frustration and ask a child to help to review the concept of asking for help.
3. Set up opportunities for all children to practice asking for help.
4. Summarize the lesson's takeaway–that it is okay to ask for help when we feel frustrated or can't do something ourselves.

How-to Step 4: *Take advantage of naturally occurring situations to reinforce and review social-emotional skills.*

- Use naturally occurring situations to review, practice, and reinforce the target skills.
- Remind children prior to an activity about what they have learned, including how to manage emotions and interact with others.
- Monitor and reinforce children when the desired actions or words are seen.
- Encourage children to look for and recognize the desired behavior in others.

Example: *Sample plan for using activities from the curriculum each day.*

Monday	Introduce children to the concept of deep breathing to calm down when they feel upset.
Tuesday	Read a story about getting mad and getting into trouble. Talk about what the characters could have done to calm down when they felt mad.
Wednesday	Let children draw a picture showing their mad feelings and their calm feelings. Ask children to talk about what made them feel mad and how they calmed down.
Thursday	Set up an obstacle course with some physical challenges. Have children practice taking a deep breath to calm down when they reach each station, so they are ready to try the challenge.
Friday	Read another story that involves a character getting mad or frustrated. Role-play a new ending that shows how the characters could take a deep breath to calm down.

Reinforce throughout the week

- Model the process of taking a deep breath to calm down.
- Find times when the class can practice taking a deep breath to calm down.
- Watch for children who take a deep breath and praise them.
- Remind children to take a deep breath to calm down when they are starting to get visibly excited or upset.

How-to Step 5: *Inform parents, caregivers, and guardians about the social-emotional skills children are learning so skills can be practiced and reinforced at home.*

- Send a brief note or email to parents, caregivers, and guardians informing them of the social-emotional skill that children are learning.
- Provide guidance in the note on what parents, caregivers, and guardians could do and say to help their children develop their social-emotional skills.

How-to Step 5 (continued): *Inform parents, caregivers, and guardians about the social-emotional skills children are learning so skills can be practiced and reinforced at home.*

- Include the specific language or vocabulary that corresponds to the social-emotional skill.
- When possible, translate letters into the primary language spoken by the parents, caregivers, and guardians.

Example: *Sample note to parents, caregivers, and guardians.*

Dear Families,

Children are learning all about feelings this week, including how to name their feelings! Help your child learn more about naming four basic feelings—happy, sad, mad, and scared. Children are learning to say:

I am feeling _____ because _____.

Thank you for your help encouraging your child to name their feelings at home!

Sincerely,

Your Child's Teacher

Example: *Activities to suggest in take-home letters.*

Children are learning to…	Children will practice this by…
Cooperate/work together	Helping to pick up toys; working together to prepare a meal
Cope with strong emotions	Taking a deep breath or counting breaths to calm down; counting to three to calm down; putting feelings into words
Compromise	Organizing an area of the house together, such as the child's bedroom or play area
Share	Sharing a snack with another family member
Play fairly, take turns, be a gracious winner/loser	Playing a board game as a family; taking turns with siblings for preferred activities, such as choosing which book to read first

Potential Obstacles

- *"I don't see why I need to devote time to social-emotional learning with the whole class. It seems like a waste of time when only three children in my class are disruptive, do not comply, and throw tantrums. The others are well-behaved."*
  - Children need to practice and discuss social-emotional skills many times, so they are prepared to use those skills in different situations, including when they enter kindergarten.
- *"Some children have behavior that is difficult to manage, and I don't know how to change that."*
  - Consult with other teachers or administrators about what approach to take to teach social-emotional skills to children who need more support.

Potential Obstacles (continued)

- *"I don't know how I will find time to devote to social-emotional learning."*
  - Blend brief social-emotional learning activities with instruction on other topics, such as literacy, art, and music.
- *"I am using positive classroom management and discipline techniques. Why do I need to promote social-emotional learning separately from those techniques?"*
  - Teachers can take children's skills a step further by intentionally teaching children about social-emotional skills and offering children opportunities to practice them.

Recommendation 2: *Strengthen children's executive function skills using specific games and activities.*

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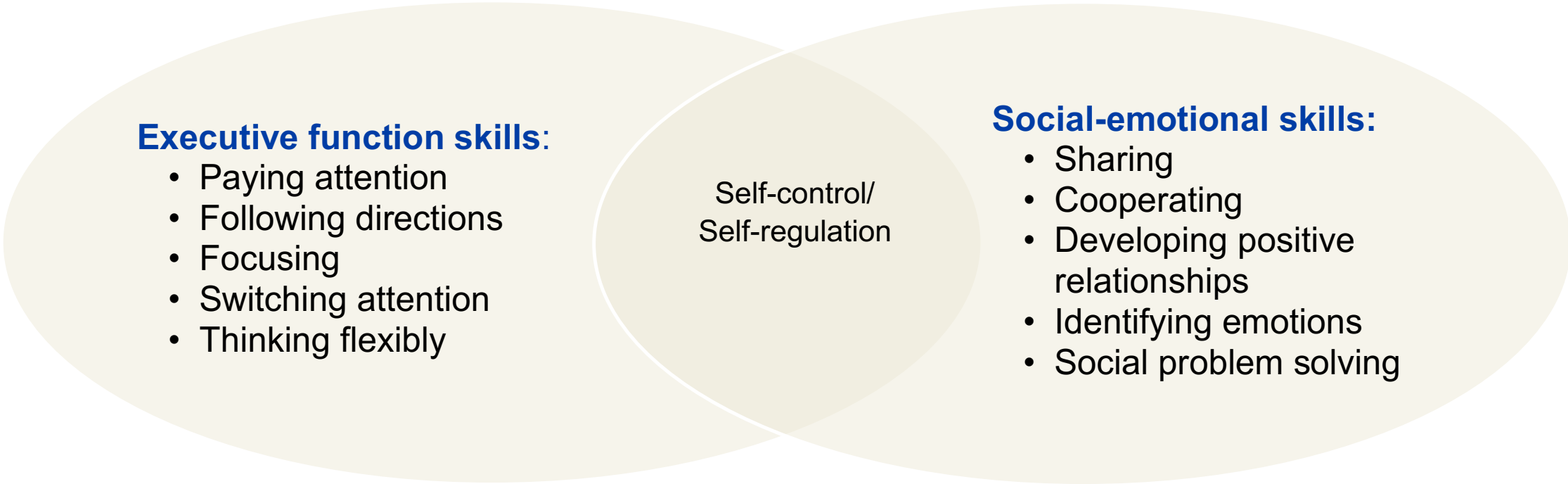
How-to Step 1: Use intentionally designed games to build children's executive function skills.

How-to Step 2: Challenge children by increasing the complexity of games and activities over time.

How-to Step 3: Embed executive function activities in literacy, math, art, or other parts of the day.

Relationship Between Executive Function Skills and Social-Emotional Skills



How-to Step 1: *Use intentionally designed games to build children's executive function skills.*

- Games that have multiple steps or instructions will help children listen to, remember, and follow directions.
- Games that require children to connect their actions to a visual, oral, or musical cue from the teacher will require children to think quickly and flexibly.
- Games where only certain children, such as children wearing something blue, respond to the teacher's directions at one time will encourage children to calmly wait for their turn.

How-to Step 1 (continued): *Use intentionally designed games to build children's executive function skills.*

- Playing a game that builds executive function typically lasts about 10–20 minutes.
- Use a consistent, predictable routine to carry out the game. The routine can include a greeting, a game, and a closing.

Example: *Games to practice following directions, thinking flexibly, and controlling impulses.*

Game	Description
Red Light, Purple Light	During *Red Light, Purple Light*, the teacher tells children which action to do when a color or shape is presented. For example, the teacher stands at one end of the room and holds up different colors of paper circles. The teacher tells the children to walk closer when a red circle is up and stop when a purple circle is up.
The Freeze Game	During *The Freeze Game*, the teacher plays music and provides instructions that encourage children to dance. For example, to dance slowly to slow songs and quickly to fast songs. Tell children to stop when the music stops.
Drumbeats	In the *Drumbeats* game, the teacher has children move in different ways based on the beat of the drum. For example, teachers may have children walk quickly to fast drumming, walk slowly to slow drumming, and freeze when the drumming stops.
Which Way? Brain Builder	For the *Which Way? Brain Builder*, the teacher stands at the front of the room with the children standing or seated with space to move around. The teacher tells the children to watch which way the teacher's arms point and make their own arms point the same way. After the children match the teacher's arm movements, the teacher changes arm positions.
Source: Committee for Children, 2013; McClelland et al., 2019; Schmitt et al., 2015: Upshur et al., 2017.	

How-to Step 2: *Challenge children by increasing the complexity of games and activities over time.*

- Once children become comfortable with a game and have mastered the initial set of rules, make the game more challenging to help their executive function skills develop further by:
  - adding more rules to the game
  - giving less guidance about how to play the game
  - increasing the speed with which the game is played
  - changing the rules for the game
  - changing the roles that children play in a game
- Encourage children to notice what is making the game more difficult.

Example: *Games where rules are changed.*

The teacher uses a dog puppet and a cat puppet to lead children in a game. The teacher asks the children to follow the commands of the dog puppet and ignore the commands of the cat puppet.

The teacher uses "nice" and "mean" voices to help children remember which puppet to obey.

To make the game more challenging, the teacher switches the rules, so children have to listen to the commands of the cat puppet and ignore the commands of the dog puppet.

Source: Zelazo et al., 2018.

Example: *Game where children go from being a follower to being a leader.*

The teacher begins a game of Simon Says and gives commands that children follow.

After a few commands, the teacher selects a child to act as Simon and give the commands.

The teacher picks a different child to lead the game each day so that all children eventually can be a follower and a leader in the game.

How-to Step 3: *Embed executive function activities in literacy, math, art, or other parts of the day.*

- Create opportunities for children to think flexibly, follow directions, problem-solve, or exercise self-control throughout the day.
- Ask children to engage in "think time" before raising their hand or to show nonverbal agreement by nodding their head or a thumbs up when another child or the teacher is giving an answer to practice self-control.

- Randomly call on children in group activities to bring children back to focus.
- Reinforce and praise children paying attention but sitting quietly.

Example: *Executive function activities to do during literacy, mathematics, and arts and crafts.*

Skill being practiced	When to practice	How to practice
Following directions	Outside play time	Play *Simon Says*. In *Simon Says*, one person is the leader and calls out actions to the classroom. If the leader says, "Simon says" before the action, then the class follows the action, such as "Simon says stand on one foot." If the leader says an action without saying "Simon says" first, then the class does not follow the action. If a child follows an action and the leader did not say "Simon says" first, then that child is out of the game.
		Read a book with repetitive information like *The Very Hungry Caterpillar,* by Eric Carle, and prompt children to remember what the caterpillar already ate.
Planning, problem-solving	During mathematics instruction	Give children a project that involves multiple steps to complete and gets more complex at each step. Have children use blocks to build different types and sizes of towers. Have them start by building a tower three blocks high using blocks of the same size. Gradually make the towers taller and use differently sized blocks. For example, the next tower could be five blocks high and use large blocks on the bottom and small blocks on top.
		Assign children to small groups. Have them take turns completing a multi-step activity. For example, to make a picture of a snowman, have each child cut out a piece of a snowman and then have the children take turns pasting their pieces onto a poster in the right order.

Potential Obstacles

- *"Isn't executive function just a part of social-emotional learning? I don't understand why I need separate activities to teach each skill."*
  - Even though these skills often develop together, the activities used to build each of these skills are distinct, and they look different for children of different ages.
- *"I tried increasing the complexity of the games we play in the classroom, but the children became confused."*
  - Children may need more practice with a simpler game before they are ready to move on to more complex rules or instructions.

Recommendation 3: *Provide intentional instruction to build children's understanding of mathematical ideas and skills.*

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How-to Step 1: Provide small-group instruction to build children's foundational understanding of mathematics.

How-to Step 2: Extend mathematics instruction beyond basic skills to include more advanced mathematical ideas.

How-to Step 3: Build children's mathematical knowledge and skills in an incremental and sequential manner.

How-to Step 1: *Provide small-group instruction to build children's foundational understanding of mathematics.*

- The panel recommends working with a small group of children to provide intentional mathematics instruction, while the other children are engaged in activities at other centers or with a co-teacher or aide.
- Dedicate at least 15–20 minutes nearly every day to small-group mathematics instruction.
- Start by engaging in a brief conversation about the target mathematical idea or skill.

How-to Step 1 (continued): *Provide small-group instruction to build children's foundational understanding of mathematics.*

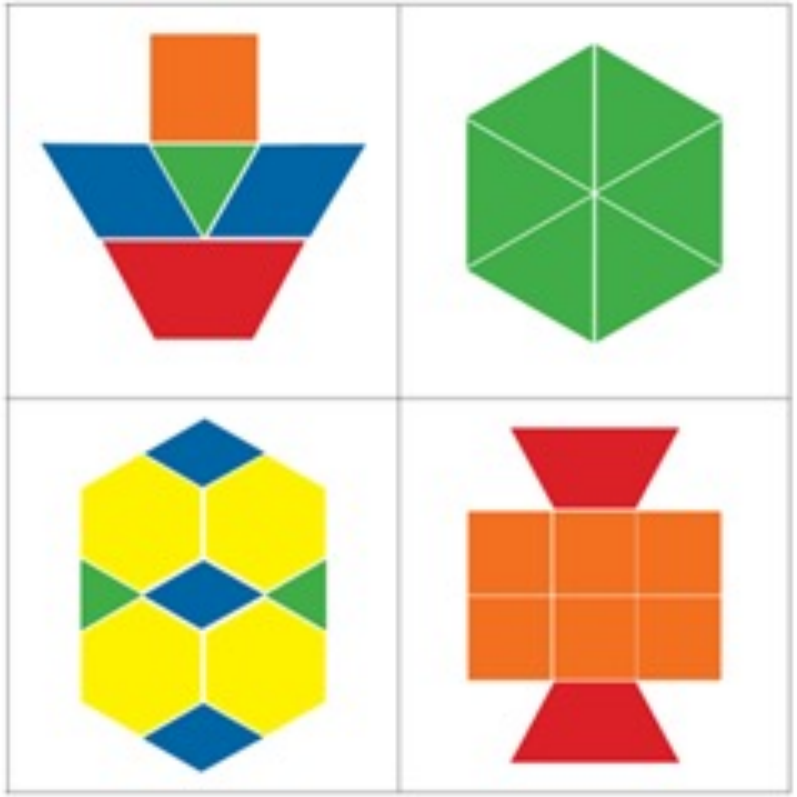
- Follow up with an engaging, interactive hands-on activity that has been chosen intentionally to help children apply that new idea or skill.
- Demonstrate how to carry out the activity and allow children to do the activity several times to get plenty of practice with the new idea or skill.

Example: *Children use pattern blocks to copy designs.*

The teacher creates a design with pattern blocks and asks the children to take a moment to observe the design carefully. The teacher asks students to name the shapes and describe their characteristics.

The teacher leaves the original design visible and asks the children to use pattern blocks to copy the design.

The teacher then asks the children to check their design by asking "Does your design look the same as mine?" Afterward, the teacher can create new designs for the children to copy.



Example: *Children play a number-path game to practice counting and number recognition.*

Each child takes a turn to play. It is Asha's turn. Asha's block is on number 3.

Asha spins a spinner to see how many spaces to move. The spinner lands on number 2.

Asha takes the block, which is on 3, and "counts on" from 3. Asha counts, "4, 5" while moving the block 2 spaces and places it on 5.

Source: Game adapted from Ramani and Siegler, 2011. Photo provided by the Ben and Maxine Miller Child Development Laboratory School at Purdue University.

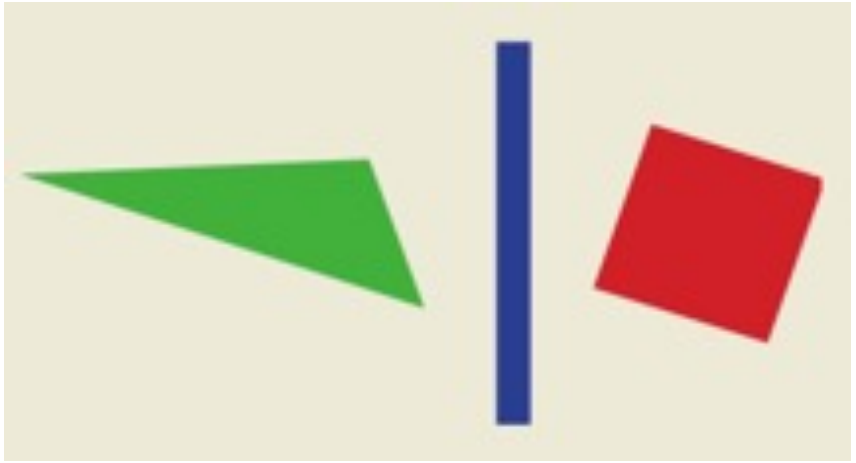
How-to Step 2: *Extend mathematics instruction beyond basic skills to include more advanced mathematical ideas.*

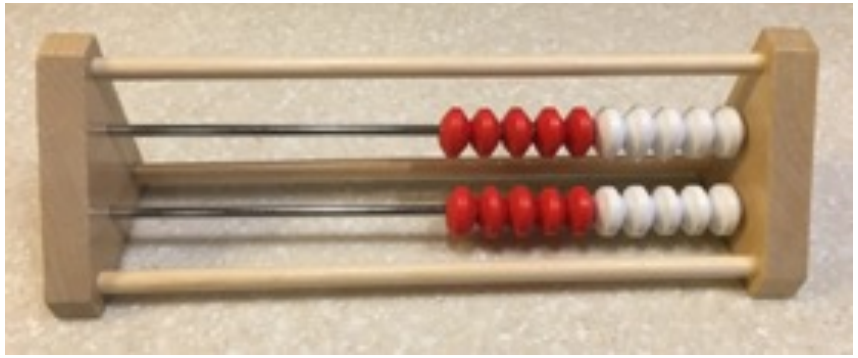
Mathematics instruction at this age should extend beyond verbal counting, shape naming, and numeral identification. More advanced mathematical ideas include:

- **characteristics of shapes** like sides, curves, and angles. For example, teachers can ask questions such as "How do you know this is a rectangle?"
- **concepts of measurement** like height and length. For example, children can measure objects using classroom items such as blocks and say, "This toy is 3 blocks long."
- **number relationships**, which help children represent a quantity in multiple ways. For example, the quantity of 4 can be thought of as a set of 3 and 1 or 2 sets of 2.

Example: *Activities that teach more advanced mathematics.*

- Ask children to discuss characteristics of a long and narrow rectangle, a triangle with unequal sides, or a square that is shown at an angle.
- Set up a measurement scavenger hunt.
- Ask children how many items they see, such as how many crackers they have at snack time.
- Ask children to roll a die and quickly say the number of dots on a side.
- Help children use a ten-frame or a number rack such as a rekenrek (pictured) to visualize quantities.





How-to Step 3: *Build children's mathematical knowledge and skills in an incremental and sequential manner.*

- Children's knowledge of mathematical ideas and skills builds incrementally over time, following typical natural developmental progressions.
- Developmental progressions in mathematics are the order in which mathematical skills and understanding typically develop. For example, children learn to recognize and name shapes before they combine or separate shapes.

How-to Step 3 (continued): *Build children's mathematical knowledge and skills in an incremental and sequential manner.*

- Consider adopting a curriculum supplement that follows children's developmental progressions such as one that uses early mathematics learning trajectories.
- Learning trajectories link instructional activities to specific points in developmental progressions. Instruction using learning trajectories provides an intentional sequence of mathematics instruction and activities.

Example: *A partial learning trajectory for learning about shapes.*

DEVELOPMENTAL PROGRESSION

Mathematics goal	To match shapes that are different sizes and orientations	To recognize less typical shapes such as tall, narrow triangles	To build a shape from "parts"
Examples of progression of skills to meet the goal	The child can match two rectangles that have different orientations.  The child can match two triangles that are different sizes. 	The child recognizes that any shape with three sides is a triangle regardless of how long the sides are. The child recognizes that a long, skinny rectangle is still a rectangle.	The child can create a triangle when asked to make a triangle with sticks. 
Instructional activities matched to the developmental progression	**Shape Matching**: Have children match shapes from a small set of pattern blocks. Lay out a set of shapes and encourage children to explore the shapes. Ask the children to (1) find the matching shape, (2) name the shape aloud, and (3) explain how they know.	**Shape Hunt**: Set triangles around the classroom such as triangular-shaped blocks and have children find as many triangular-shaped objects as possible. Gather in a group and encourage children to describe the triangle they found. Talk about number of sides, angles, etc.	**Straw Shapes**: Provide children with straws or other "sticks" such as plastic stirrers, or dry spaghetti, and ask them to build different shapes. 

How-to Step 3 (continued): *Build children's mathematical knowledge and skills in an incremental and sequential manner.*

- To figure out where children are in their developmental progression, observe children during mathematics lessons and during conversations about mathematics.
- Record observations about children's knowledge to refer back to and guide decisions about which activities to use next.

Example: *Teacher-made observation sheet to record children's knowledge.*

Skill	Task	Date	Observation	Level of Understanding
MATHEMATICS				
Number Knowledge				
Using <u>cardinality</u> to show that the last number counted indicates "how many"	Have the child count a small set of items and ask the child to report "how many" items there are after counting.	*Nov. 22*	*I asked Miguel to count out a set of five beans I put in a cup. Then I asked Miguel, "How many beans are there?" and Miguel responded by saying "Five beans!"*	(Got it) Getting It Not Yet
Understanding the concept of "one more"	Have the child count a small set of items. Then hide the items and ask the child to say how many "one more" will be without recounting a group of items.	*March 8*	*I showed 5 dots to Aamir and asked Aamir to count them. Then I covered the dots and asked Aamir to add one more without uncovering and recounting the dots. Aamir got it right after several attempts with different numbers.*	Got it (Getting It) Not Yet
Source: Adapted from Center for Early Learning, Early Learning Matters (ELM) Curriculum, 2018.				

Potential Obstacles

- *"The children can't sit still and listen when I explain a mathematical idea or have them complete worksheets."*
  - To maintain children's engagement, choose hands-on instructional activities, keep verbal instructions short, and allow children many opportunities to contribute to conversations.
- *"I like to include a mathematics center activity for the other children to do when I am working with a small group, but the children at the center get distracted or bored quickly."*
  - When creating a mathematics center, make center activities hands-on and engaging and make sure to model for children how to engage with the materials.

Potential Obstacles (continued)

- *"We spend much of our circle time in the morning working on the calendar as our mathematics activity. There is not much time left for other math activities."*
  - The panel recommends replacing or supplementing calendar time with developmentally appropriate, intentional mathematics instruction.
- *"We teach mathematics daily to the whole class. I get frustrated because some children can count very high, and others struggle to count to 5. I don't want to keep boring some of the more experienced children while frustrating those with less counting experience."*
  - Brief whole-class activities should be paired with small-group activities intended to provide children with opportunities to apply the mathematical idea or skill.

Recommendation 4: *Engage children in conversations about mathematical ideas and support them in using mathematical language.*

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How-to Step 1: Introduce and explain the meaning of mathematical language during intentional mathematics instruction.

How-to Step 2: Conduct a math-focused shared book reading activity several times each week.

How-to Step 3: Engage children in conversations about the mathematical ideas and language they are learning throughout the day.

How-to Step 1: *Introduce and explain the meaning of mathematical language during intentional mathematics instruction.*

- Introduce and explain mathematical language during intentional, small-group mathematics instruction.
- Start with simpler words, such as *long* and *short*, and gradually introducing more complex words with similar or contrasting meanings, such as *longer* or *narrow*.
- Explain the meaning of the words and phrases using words children already know and provide concrete examples to explain their meanings.
- When appropriate, use gestures to help children understand mathematical language.

Mathematical language is the language used to talk about mathematical ideas and skills.

Example: *List of some common mathematical words and their primary topic areas.*

Mathematics Topic Area	Words
Numeracy	amount, most, many, least, more, a lot, less, fewer, fewest, equal, add, combine, subtract, first, second, third, last, same, similar, different
Geometry	triangle, circle, square, rectangle, rhombus, trapezoid, hexagon, point, round, straight, diagonal, flat, line, corner, angle
Measurement	longer, shorter, wide, narrow, distance, measure, length, half
Patterns	pattern, repeat, continue, extend, alternate, guess, predict, match, order, sequence

How-to Step 2: *Conduct a math-focused shared book reading activity several times each week.*

- Choose age-appropriate books that are likely to be interesting and that include important mathematical content.
- Before reading to the children, read the book and note words or phrases to talk about, places to stop and discuss the book's contents, and questions to ask the children to stimulate mathematical conversations.

- Read the same book 3–5 different times during separate math-focused shared book readings.
- After each shared book reading session, talk with children about the mathematical ideas or skills and language they learned.

Example: *Suggestions for choosing a book for math-focused shared book reading.*

Mathematical Topic Area	Suggestions	Examples of Books
Numeracy	• Choose books with pictures that are clear and easy for children to see. • Find books that provide opportunities for mathematical ideas like counting, adding, or taking away.	• *Anno's Counting Book*, by Mitsumasa Anno • *Mouse Count*, by Ellen Walsh • *Zero is the Leaves on the Tree,* by Betsy Franco
Geometry	• Find books that show different shapes in many ways, such as in the environment.	• *Mouse Shapes,* by Ellen Walsh • *Round is a Tortilla,* by Roseanne Thong • *The Greedy Triangle,* by Marilyn Burns
Measurement	• Look for books that depict measurement tools, such as rulers, or use measurement terms, such as feet, inches, heavy, or light. • Find books that include images that can be measured.	• *Balancing Act,* by Ellen Walsh • *Inch by Inch,* by Leo Lionni • *Who Eats First?,* by Ae-hae Yoon
Patterns	• Look for books that show patterns.	• *Anno's Magic Seeds,* by Mitsumasa Anno • *Two of Everything,* by Lily Toy Hong • *Mr. Noisy's Book of Patterns,* by Rozanne Williams

Source: Adapted from the **DREME Project**.

Example: *Suggestions for how to talk about mathematical ideas in a book.*

Numeracy:

- "Wow, there are so many frogs on this page! I don't know if I can count them all. Can you help me?"
- "Do you think there are fewer cars on this page? Or fewer trains? Let's count and see!"
- "The mouse ate one more cookie! How many did the mouse eat altogether?"

Geometry:

- Notice the shapes and ask children to describe their attributes.
- Ask children how they know a shape is a triangle, etc.

How-to Step 3: *Engage children in conversations about the mathematical ideas and language they are learning throughout the day.*

- Engage children in conversations about the mathematics throughout the day.
- Find ways to use new mathematical language many times during conversations to provide children with multiple opportunities to hear and review the words and phrases.
- Ask questions that will encourage more than one-word answers to encourage children to think and talk about the mathematics. Prompt children to use mathematical words and phrases in their responses.

Example: *Questions that encourage more detailed answers.*

1. How do you know this is a rectangle?
2. Which tower is *taller* (or *longer*)? How do you know?
3. Why do you think this tower is *tall* and this one is *short*?
4. How can you tell that this pile of leaves is *bigger*?
5. How many crackers do you think will fit in the bowl? How could we find out?
6. Which pile of blocks has *more*? How do you know?
7. How could we share this so that everyone has the *same amount*?
8. Are these two pieces the same shape or different shapes? How do you know?

Example:
Teacher prompts child to use mathematical language.

The teacher places several large shape cutouts around the playground for a "shape hunt" during outdoor play time. A child finds and identifies a triangle.

Teacher: How do you know this shape is a triangle?

Mischa: It has three sides.

Teacher: Yes, a triangle has three sides and three angles. Let's count how many *angles* this triangle has. One, two, three! Tell, me how many?

Mischa: Three.

Teacher: Yes, three angles. Can you say, "three angles"?

Mischa: Three angles.

Potential Obstacles

- *"I have a hard time incorporating mathematical language in my conversations with children. It's just not part of my everyday language."*
  - Start small, focusing on specific language or by trying to refer to things with numbers and locations. Over time add different topics, such as how to think about mathematics.

- *"Many children in my class are dual language learners. How can I help them understand the mathematical words and phrases?"*
  - Use words or phrases children are learning several times during activities that allow children to "see" the mathematics.

Potential Obstacles (continued)

- *"When we talk about math, children forget to use the mathematical language they are learning."*
  - Be sure to use the words repeatedly and remind children how they are pronounced and used in conversation.

Recommendation 5: *Intentionally plan activities to build children's vocabulary and language.*

Recommendation 5: *Intentionally plan activities to build children's vocabulary and language.*

How-to Step 1: Choose 3–5 unique words to focus on each week and include review of those words in other weeks.

How-to Step 2: Introduce the words and their meanings.

How-to Step 3: Choose activities and materials that will offer children opportunities to practice using the target vocabulary words.

How-to Step 4: Engage in interactive conversations with children to reinforce or solidify understanding of vocabulary words.

How-to Step 1: *Choose 3–5 unique words to focus on each week and include review of those words in other weeks.*

- Look for words that will be useful to know because they occur frequently in books, conversations, or other academic contexts–even words that seem advanced, such as *illustrator*, *author*, *title*, *discuss*, and *similar*.
- Choose a group of words that relate to a topic or belong in a category. When possible, choose a topic the children are interested in.

How-to Step 1 (continued): *Choose 3–5 unique words to focus on each week and include review of those words in other weeks.*

- At the beginning of the year, choose words that are easy to depict in pictures or are easy to demonstrate.
- Over time, add in abstract language that is harder to depict in pictures, including abstract nouns and verbs, prepositions, glue words, or other words typically used in school that are not easy to visualize.

What Are Glue Words?

Glue words, also referred to as high-frequency words, are some of the most common and essential words in the English language.

They are the foundation of academic language and are often difficult to depict in pictures. When children don't know the meaning of glue words, sentences can be difficult to understand.

Some common glue words include *in, on, the, was, for, that, said, a, if, of, to, there, will, be, what, get, go, like, think, some, new, make, much, every, should, just, and, is, this, from, with, have, an, by, it, asked*.

How-to Step 2: *Introduce the words and their meanings.*

- Spend time directly discussing the word and what it means.
- Begin by explaining the meaning of the vocabulary word using words children already know.
- If using a book to introduce words, point to the relevant picture in the book and present a simple meaning that relates to what is happening in the book.

How-to Step 2 (continued): *Introduce the words and their meanings.*

- In later book readings and experiences to which the word relates, pause to engage children in a conversation about the word and provide additional practice with its meaning.
- Ask children to share something related to the word or think about when they experienced the word.

Example:

Teacher teaches a word and gradually asks children to do more with the word.

The first time the word *fierce* appeared in a book, the teacher stops briefly to explain the meaning in the context of the book.

The second time the word *fierce* appeared, the teacher stops reading the story to ask the children if they know what *fierce* means. The teacher confirms the meaning and asks the children to make a fierce face and says, "Everyone looks so scary!"

The next day the teacher reads a book about a *Tyrannosaurus rex*. The teacher asks the children, "Who remembers what *fierce* means?" One child says, "Scary." The teacher responds, "That's right. So, when you are a Tyrannosaurus rex, you should act fierce."

Later in a small group, the teacher asks children to sort pictures of animal faces into piles of scared faces and fierce faces.

Source: Toub et al., 2018.

Example: *Practices to expand the meaning of vocabulary words and examples of each.*

Ways to Expand the Meaning of Words	Example
Act out the word or use a gesture to clarify the meaning of the word.[126] Model the action or gesture and then have children practice doing the action or gesture. Consider using the word in a different context from the book.	When explaining the meaning of *rummaging* for a toy, mime rummaging with your hands.[127] Then say, "Let's pretend we're rummaging around to look for a toy."[128] If the book talks about *donning* slippers, demonstrate the motion of putting on slippers[129] and ask children to pretend to put on their slippers. Or use the word in a different context, such as, "Today I donned my new jacket [demonstrate the motion of *donning* a jacket]. I put on my new jacket."[130]
Provide a synonym or an example of the vocabulary word. It can also be helpful to provide an example of a word that is a category and an example of a word that does not fit in the category.[131]	The teacher sits *silently* one moment, pretends to be loud the next, and asks children about the difference or asks children to identify when the teacher is being silent or not silent. When discussing the word *insect*, the teacher provides an example, *grasshopper*, and explains that a *bear* is not an *insect*.
Show a short video clip to provide some background information to help make the meaning of the word concrete.[132] Choose a video that clearly depicts the word and is less than 3 minutes long. Plan questions to ask about the video to ensure that children engage with the topic.	Show a short clip about a *desert* or *jungle* or about an object with which children may not be familiar, like a *yacht*.

How-to Step 3: *Choose activities and materials that will offer children opportunities to practice using the target vocabulary words.*

- Children need multiple opportunities to think about and practice the words they are learning.
- Set up opportunities for the words to come up in children's play.
- Consider leading children in acting out the word, possibly using figurines, puppets, or other props.

How-to Step 3 (continued): *Choose activities and materials that will offer children opportunities to practice using the target vocabulary words.*

- As children interact with the activities and materials, look for ways to incorporate conversation about the target vocabulary.
- When possible, extend the conversation about the vocabulary word by asking children follow-up questions.

Example: *A child acting out the word **emerge**, by emerging from a tunnel.*

How-to Step 4: *Engage in interactive conversations with children to reinforce or solidify understanding of vocabulary words.*

- Look for ways throughout the day to reintroduce the target vocabulary words into conversations with children to provide additional opportunities for children to hear and use the words.
- Use questions strategically to prompt children to respond using the words they have learned.
- Add additional words into conversations when appropriate.
- Choose words that are relevant to the children, their lives, cultural backgrounds, and what is happening during the preschool day.

Example: *Teacher facilitates a conversation about additional vocabulary.*

When children exclaim that they saw an airplane fly overhead, say, “Oh wow, that airplane is so high in the sky.”

Pause for children to comment on your observation and say, “I wonder how the airplane got up there.

Who can tell me what the plane had to do to get up there?” Listen to children’s answers.

Explain that airplanes have powerful engines and provide a simple explanation of the meaning of powerful and engine. “

Potential Obstacles

- *"I was told to teach only vocabulary words that appear in books or to look for books that include the vocabulary words I want to teach."*
  - Vocabulary can also be introduced in other ways, such as using and defining descriptive words in response to something a child has said.
  - For example, if the child says, "I have a truck," respond with "You have a big, red truck. Is it heavy? Or light?" Let the child respond and then provide a simple explanation of heavy and an example of something that is heavy and something that is not. Ask the child to think about what else is heavy.

Potential Obstacles (continued)

- *"I don't know how to choose vocabulary words my children don't know."*
  - Choose vocabulary related to children's interests that might help them better understand the topic.

Potential Obstacles (continued)

- *"I am not very comfortable engaging in conversations with children when they play. I want to let them play."*
  - One way to engage children is to observe something they are doing well and then add in adjectives to expose them to more vocabulary.
  - For example, if a child is filling a pot with mud, say, "I see you filling the big pot with mud." The child might say, "I am making soup." The teacher could talk with the child about the ingredients they are including in the soup or how long the soup will need to boil before it will be ready to eat.

Recommendation 6: *Build children's knowledge of letters and sounds.*

Recommendation 6: *Build children's knowledge of letters and sounds.*

How-to Step 1: Initially focus on listening for sounds in words.

How-to Step 2: Intentionally introduce a new letter and its sound.

How-to Step 3: Use materials and activities that allow children to practice identifying letters and their corresponding sounds.

How-to Step 4: Include print throughout the classroom to provide additional opportunities to discuss letters and their sounds.

How-to Step 1: *Initially focus on listening for sounds in words.*

- Point out words are made up of sounds like /b/ and -ike in *bike* and /b/ and -all in *ball*.
- Explain that some words start with the same sound, such as /l/ in *leg*, *leaf*, and *long*, and others have the same last sound, such as /t/ in *part*, *sit*, and *boot*.
- Explain that when words share the same blended end sound, they rhyme. For example, explain that the words *boat* and *moat* both end in the blended sound -oat.
- Tell children to listen for words that share the same beginning or end sound in a song, book, or poem with an alliteration or with words that rhyme. For example, have them clap when they hear words that end with -at.

How-to Step 1 (continued): *Initially focus on listening for sounds in words.*

- Continue to point out sounds in words or to ask children what sounds they hear, when the opportunity arises.
- Periodically include previously introduced sounds for review.

How-to Step 2: *Intentionally introduce a new letter and its sound.*

- Choose one letter and sound to focus on each week, in addition to pointing out letters in print in other parts of the classroom.
- Start with letters and sounds children are familiar with and add on other letters and sounds from there.
- Clearly explain the letter name and the sound the letter makes. Show children how to write the target letter.

- For letters that have more than one sound, explain that some letters make more than one sound, and tell children the sounds.

How-to Step 2 (continued): *Intentionally introduce a new letter and its sound.*

- Share additional words children are familiar with that start with the target letter.
- Strengthen children's association with new letters by connecting the letter to a memorable experience that starts with the same letter.
- Include discussion of previously learned letters and their sounds to help children learn to discriminate between the letters.

How-to Step 3: *Use materials and activities that allow children to practice identifying letters and their corresponding sounds.*

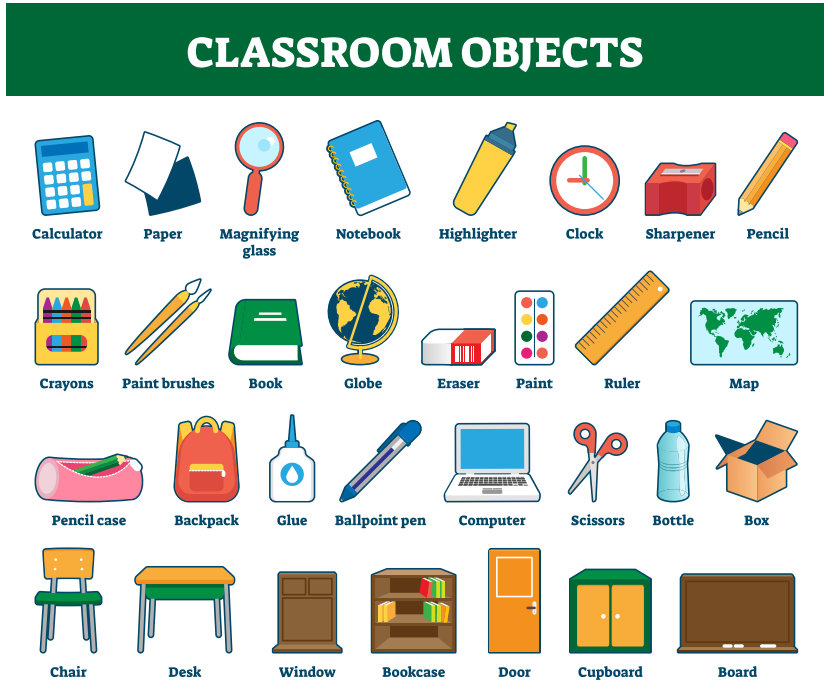
- Children need multiple and repeated exposures to letters and the sounds they make.
- Carefully choose activities and materials that can be used during small-group or whole-class activities or centers throughout the week to provide children with practice identifying and discussing the target letter and sound.
- Be sure to include previously learned letters for children to review.
- Games can be a fun way to review letters that were previously learned.

Example: *Some activities that can be used to discuss letters.*

- Read books that highlight the target letter or words that start with the target letter.
- Set out materials children can use to practice writing letters on paper or in sand or salt; or materials they can use to form letters, like play dough, pipe cleaners, or beans.
- Set out objects or toys that begin with a certain letter and ask children to categorize the items by their beginning sound.
- Call out words and have pairs of children run to a pile of letters on the floor and look for the letter the word starts with and run back. This will burn off energy and provide practice locating the letters.
- Set up an alphabet maze. To get through the maze, children have to find items that begin with the letter and avoid paths that contain items that begin with other letters.

How-to Step 4: *Include print throughout the classroom to provide additional opportunities to discuss letters and their sounds.*

- Making print a regular part of the classroom will not only help familiarize children with letters, but also provide multiple opportunities for teachers to discuss letters and the sounds they make.
  - Use labels throughout the classroom.
  - Use children's names throughout the classroom.
  - Write out the daily schedule.
  - Bring print materials into dramatic play.
  - Set up a reading library or quiet space for children to explore print independently.



Potential Obstacles

- *"I don't know what letters or sounds to teach, when to move on, or when to backtrack and spend more time on a letter or sound."*
  - Set aside time each week to discuss letters and their sounds with each child. Keep track of each child's letter knowledge by jotting down what they grasped and what they need to work on.
- *"My children don't seem very excited about letters/sounds?"*
  - Link the letter to the children in some way. Plan activities that will engage children.

Recommendation 7: *Use shared book reading to develop children's language, knowledge of print features, and knowledge of the world.*

Recommendation 7: *Use shared book reading to develop children's language, knowledge of print features, and knowledge of the world.*

How-to Step 1: Select a variety of informational and narrative books that are appropriate for 3-, 4-, and 5-year-olds.

How-to Step 2: Prior to the lesson, plan the purpose for reading the book and determine when to discuss certain topics with children.

How-to Step 3: Prepare children for listening to and discussing the content of the book before reading the book aloud.

How-to Step 4: Engage in conversations with the children while reading the book.

How-to Step 5: Align literacy activities with the focus of the shared book reading.

How-to Step 1: *Select a variety of informational and narrative books that are appropriate for 3-, 4-, and 5-year-olds.*

- Choose books that touch on topics of interest to children or that relate to something they may have experienced, such as books about making friends with a new child who just moved to their block or playing make-believe.

How-to Step 1 (continued): *Select a variety of informational and narrative books that are appropriate for 3-, 4-, and 5-year-olds.*

- Ensure that children regularly see people like themselves in the books that are read, as well as people from other cultures.
- Choose books that align with the focus of the literacy lesson for the day or week, such as books with print features or books that include words with the target letter, or books that have interesting or large print.

How-to Step 1 (continued): *Select a variety of informational and narrative books that are appropriate for 3-, 4-, and 5-year-olds.*

- Consider reading informational books that cover topics relevant to the material recently read about in narrative books.

Informational books are nonfiction or expository books that inform the reader about a specific topic and include accurate facts.

Narrative books are written accounts of a connected series of events. They can include both fiction, such as novels and short stories, as well as nonfiction, such as memoirs, biographies, and news stories.

How-to Step 2: *Prior to the lesson, plan the purpose for reading the book and determine when to discuss certain topics with children.*

- Plan a different focus for each time a book is read.
- Review the book ahead of time to determine when to pause to discuss:
  - vocabulary;
  - print features like font changes, speech bubbles, or letters; or
  - questions or prompts related to the content of the book.

How-to Step 2 (continued): *Prior to the lesson, plan the purpose for reading the book and determine when to discuss certain topics with children.*

- Write what to point out or what to ask on sticky notes and place them on the book.
- Ensure that the stopping points during reading are spread out enough so as not to interfere with the children's understanding of the book.

Example: *Three readings of the same book for different purposes.*

- **Time 1:** Read the entire book so children can hear the whole story or all the content.
- **Time 2:** Point out and discuss vocabulary, letters, and other interesting parts of print, such as the table of contents.
- **Time 3:** Review some letters and vocabulary and engage in a conversation or an activity based on the topic of the book.

Example: *Four readings of the same book for different purposes.*

- **Time 1:** Show children the book. Discuss the cover page and pictures on each page before reading the book.
- **Time 2:** Point out and discuss vocabulary words and engage in activities around the vocabulary.
- **Time 3:** Review vocabulary. Discuss a letter and the content in the book.
- **Time 4:** Discuss what is happening in the book or ask children to retell what the book was about.

How-to Step 3: *Prepare children for listening to and discussing the content of the book before reading the book aloud.*

- When children know something about the topic of the book, they can accurately connect the information in the book to something they know, have heard about, or have experienced.
- Start by asking children what they already know about the topic of the book.
- Discuss connections between what they know and what the book is about.
- Invite children to share their thoughts on the topic.

How-to Step 3 (continued): *Prepare children for listening to and discussing the content of the book before reading the book aloud.*

- Listen to what children share to decide whether they have enough knowledge about the topic to understand and connect with the book.
- When children do not have enough knowledge, present information that might help familiarize them with the topic and engage in a multi-turn conversation to prepare children to better understand what the book is about.

Example: *Ways to familiarize children with the topic in a book.*

- Facilitating activities that allow children to work with the topic, such as exploring their sense of touch or smell and discussing what they noticed before reading about the five senses;
- Reading and discussing a simpler book, such as a short story about a family preparing for a hurricane before reading an informational book about hurricanes;
- Acting out a scenario or word related to the topic, such as using figurines to show a man purchasing soap at a checkout counter at a grocery store;
- Showing pictures and discussing different parts of the pictures that relate to the story, such as showing pictures of the inside of an airport and discussing different things people do at the airport before reading a book on the same topic; or
- Presenting a short video clip (less than 3 minutes) that introduces the content in the book, such as a video clip about insects before reading a book about grasshoppers.

How-to Step 4: *Engage in conversations with the children while reading the book.*

- While reading, stop periodically at the stopping points determined in Step 2 to encourage children to discuss a word, a letter, or an interesting picture.
- Ask questions that encourage multi-word answers and multi-turn conversations.
- Ask children to justify their answers.
- When children have a question about the book, walk them through looking back in the book to find the answer.

How-to Step 4 (continued): *Engage in conversations with the children while reading the book.*

- If children can answer simpler questions, begin asking increasingly complex questions. Teachers can ask children questions that encourage children to
  - use vocabulary words or
  - make connections about what happened in the book.
- This might include questions that ask
  - why a character did something,
  - what the character might be feeling, what might happen next, or
  - what experiences the children have that are similar.

Example: *Questions that increase in complexity.*

Questions that can be answered by looking at the pictures:

- What happened when they woke up?
- What did they see?
- What does the button do?

Questions that can be answered by making connections between the pictures or parts of the book:

- How did Vera know that Thomas was pulling the rope?
- What happens to the tadpole's legs when they start growing?

Questions that can be answered by connecting what children know to what happened in the book:

- How do you think they would feel if they won the prize?
- What does it mean to “pack their bags”?

How-to Step 5: *Align literacy activities with the focus of the shared book reading.*

- Interactive small-group activities provide children opportunities to use or rehearse what they learned from the book.
- When the focus is discussing the content of the book, set up activities related to understanding the story or the information presented in the book.
- Consider using puppets, figurines, or role-play to act out a story.

How-to Step 5 (continued): *Align literacy activities with the focus of the shared book reading.*

- If children need help remembering the book, give them hints.
- After reading a book multiple times, leave the book in the classroom library or at a center aligned with the content of the book.
    - This allows children to look through the book independently and say what they remember about the story.

Potential Obstacles

- *"Some of my children can't answer questions about the book."*
  - Teachers may need to explain that they are asking questions to learn what the children are thinking, not because they are unhappy with the children. When necessary, prepare children to answer "*wh*-" questions about the book.
- *"My children don't seem to understand what I read to them."*
  - If children are not understanding books about a topic, the panel suggests spending more time on the topic with a child one-on-one or with a small group of children.
  - If the whole class is not understanding the topic, the panel suggests finding a simpler book on the topic or planning other activities on the topic that can help clarify the topic for the entire group.

Potential Obstacles (continued)

- *"My children have such a hard time sitting through an entire book."*
  - Consider engaging children during reading or reading while children are eating or when they are sitting still but their hands are busy. Also consider reading a little longer each week or reading only short portions of a longer book.
- *"I can't find any books that depict people like the children in my classroom. The books don't include experiences relevant to their lives."*
  - Visit the local library to find a wider variety of books or consider creating a simple book.

Questions?

This presentation contains a few examples from the practice guide.

The full practice guide and supporting materials provide more details and are available on the What Works Clearinghouse website (https://ies.ed.gov/ncee/wwc/PracticeGuide/30).

Submit questions and requests via email to the WWC Help Desk at Contact.WWC@ed.gov.

Thank you