

California Preschool/Transitional Kindergarten

Learning Foundations

Presentation at CAAEYC TK Symposium
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For Three-to-Five-and-a-Half-
Year-Old Children in Center-Based,
Home-Based, and TK Settings

California Preschool/
Transitional Kindergarten
**Learning
Foundations**

**Approaches
to Learning**



For Three-to-Five-and-a-Half-
Year-Old Children in Center-Based,
Home-Based, and TK Settings

Sub-Strand — Curiosity and Interest
Foundation 1.1 Curiosity and Interest
**Early
3 to 4 ½ Years**

Express interest in some familiar and new objects, people, and activities in their immediate environment. Seek information by exploring with their senses, describing their observations, and asking simple questions.

**Later
4 to 5 ½ Years**

Express interest in a broader range of familiar and new objects, people, and activities by exploring more extensively with their senses, describing their observations in greater detail, and asking more detailed questions.

Children may demonstrate curiosity and interest in varying ways, depending on individual and cultural differences. In some cultures children are not expected to ask questions to adults, while in other cultures they are encouraged to do so.

Early Examples

■ A child explores a flower by looking at it closely while touching the petals, the leaves, and the stem.

Later Examples

■ A child explores flowers by looking at them closely and touching the leaves as they compare them and notice the similarities and differences between them. The child expresses to a peer, “These flowers are furry and white, but these are yellow and smooth.”

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Foundation 1.1 Curiosity and Interest

Early
3 to 4½ Years

Later
4 to 5½ Years

Early Examples (continued)

● A child who is blind shows excitement and asks, “What is that?” when the teacher brings out bongos and begins to play them. The child holds out both arms and says, “What are they like?” indicating a desire to touch and explore the bongos manually.

A child who is playing by themselves overhears another child talking about going to the park over the weekend. The child turns to their peer and comments, “I go to the park, too. With my cousins! Who do you go with?”

A child flips through the pages of a new book with a teacher and points to an image in the book. The child communicates, “Look! A *doumbek*,”* and begins dancing. The teacher asks, “It is? Wow, I didn’t know that! How did you know what that was?” The child responds, “My *amty* [aunt in Arabic] has one!” The teacher asks the child if they would like to ask their *amty* if they could bring the *doumbek* for show-and-tell.

*A *doumbek* is a Middle Eastern drum-like instrument.

Later Examples (continued)

● A child shows excitement when the teacher brings out a *dizi*** during music time. The child asks, “What is that? A flute? How does it make that noise?” The teacher responds, “You are asking thoughtful questions. Do you want to hold it and try to figure out how to make sounds with it?”

During free playtime, a child with autism plays with toy frogs for the second day in a row and uses a communication tablet to ask, “What do frogs eat?”

During a painting activity, a child explores paints by mixing yellow and blue and communicates using Arabic and English, “I mixed yellow and blue to paint my favorite bird! Now it’s green!”

**A *dizi* is a Chinese transverse flute.

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Foundation 1.1 Curiosity and Interest

Early
3 to 4½ Years

Later
4 to 5½ Years

Early Examples (continued)

While making acorn flour* with the help of the teacher, a child touches the flour after it is ground and sifted and communicates, “It’s smooth now.”

*Acorn flour has historically been a food staple for some Native nations and tribal communities in California. It is made by grinding acorns using a mortar and pestle.



Science — The above foundation is similar to Science foundation 1.3 on asking questions. Both domains intentionally include foundations on showing curiosity and interest through active exploration, making observations, and asking questions. In Approaches to Learning, this foundation describes children’s disposition toward exploring the world and learning about objects, people, and activities in their environment.

Supporting Curious Learners

Children show natural curiosity as they explore their environment and make new discoveries. Teachers can support children in developing and sustaining their curiosity by creating safe, inviting environments where wonder and discovery are valued. Here are some ideas to support children’s curiosity:

- Regularly introduce new interactive objects, materials, and experiences and give children the opportunity to explore on their own. Children can find innovative ways to use objects or materials when they feel safe to explore and are given the opportunity to explore.
- Acknowledge and expand on children’s interests. When children show interest in a particular topic or activity, the teacher can provide materials and books or tailor learning experiences that focus on this topic. For instance, if a group of children show interest in jungle animals, the teacher could add books to the room library or create an art activity about jungle animals. It can also be helpful to establish a relationship with a child’s family to learn more about their interests.
- Ask children “what,” “why,” and “how” questions, in their home language when possible, to promote wonder and reward their questions by responding enthusiastically. When teachers do not know the answer to children’s questions, they can model curiosity for children. For instance, a teacher might say, “That’s a good question. I was wondering that too. Let’s read this book to find out,” or “Let’s ask someone to help us figure this out.” Modeling solutions helps children begin to identify their own strategies the next time they have a question.
- Connect with families to learn about children’s culture and backgrounds and encourage children to share aspects of their culture (such as music, dances, or family traditions) with others. When children see themselves represented in learning experiences, they are drawn in and interested in learning more. Learning about others can also evoke curiosity and wonder among peers. For instance, children may find aspects of another child’s culture fascinating and want to learn more about it.

California Preschool/
Transitional Kindergarten
**Learning
Foundations**

**Social and
Emotional
Development**



For Three-to-Five-and-a-Half-
Year-Old Children in Center-Based,
Home-Based, and TK Settings



Sub-Strand — Equitable Social Interactions

Foundation 3.3 Fairness and Respect

Early 3 to 4 ½ Years

Demonstrate understanding of sharing and treating those who may be similar or different from them with fairness, although require some adult prompting to share.

Later 4 to 5 ½ Years

More consistently share with others and treat others with fairness and respect with less adult prompting, including calling out unfairness in play and daily activities.

Early Examples

■ In a puppet show, a teacher demonstrates that the Ariel puppet is feeling mad because the Hou puppet says that girls cannot play his game. The teacher asks the class, “Do you think that what Hou did was kind?” A child responds, “No. Hou should let Ariel play.”

● A child shares a book with a peer who speaks a different language. As they both look at the book, the peer points to a toy on the page and labels it in their home language. The child repeats the word.

Later Examples

■ A child walks toward another child and comments to the rest of their peers, “Daniel wants to play chef, too! Let’s give him a chance,” and places play food on the armrest of Daniel’s adaptive chair.

● A child reminds a teacher that a peer who speaks a different language has not yet had a chance to answer the question. The teacher replies, “Thank you for being a caring friend. Can we ask the question again together?” and restates the question along with the child.

A child steps back while holding all the markers that were in the container. A peer comments, “That’s not fair. You can’t take them all. It’s my turn now.” The child responds, “How about we split?” The peer takes half of the markers in their hands, and they color next to each other.

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Foundation 3.3 **Fairness and Respect**

Early
3 to 4½ Years

Later
4 to 5½ Years

Early Examples (continued)

A child who has a physical impairment and cannot stand up independently is playing near the car ramp. The teacher suggests that another peer move the car ramp closer and demonstrates placing a car on the car ramp and letting it go. The child then hands a car to a peer and says, “Your turn.” They both have fun together taking turns with the cars.

Later Examples (continued)

A child comes to the defense of a boy who is teased by a peer for having their nails painted “like a girl.”



History–Social Science — The above foundation is related to the History—Social Science foundation 3.3 on understanding different needs and fairness. For young children, fairness may mean being kind to others, sharing equally, or allowing others to participate (Hazelbaker et al. 2018; Smetana 2006).

Guidance for Teachers to Promote Equitable Social Interactions

Promoting equitable social interactions is part of making an inclusive space possible for all children to thrive and fully participate in the group. For young children, treating others equitably starts with understanding respect and fairness, which may look like being kind to others, sharing equally, or allowing others to participate. Children’s understanding of fairness and how to promote fairness becomes more advanced over time. In the process of learning how to treat and play with others fairly, children may exclude others. When children exclude others, teachers have an opportunity to encourage children to be inclusive and model how they can include others in play and daily activities. Example strategies include the following:

- Reading stories and acting out scenarios of peer exclusion where children can help brainstorm strategies to be more inclusive.
- Facilitating collaborative small group activities where children share roles and responsibilities with others.
- Cocreating expectations and agreements for inclusion, fairness, and respect for all identities represented in the group; for example, teachers can describe what children can do to be a “super friend” during circle time, such as sharing with others, looking out for others when they need help, or making sure everyone who wants to play can play.

California Preschool/
Transitional Kindergarten
**Learning
Foundations**

**Language
and Literacy
Development**



For Three-to-Five-and-a-Half-
Year-Old Children in Center-Based,
Home-Based, and TK Settings

Language and Literacy Development

Foundational Language Development





Strand: 1.0 — Listening and Speaking

Sub-Strand: Vocabulary

Children who are multilingual learners are able to draw on their vocabulary knowledge in any language they know when learning and understanding the world. This is known as translanguaging. A child who is a multilingual learner may know some words in only one language and some words in more than one language. A multilingual child’s vocabulary includes the words they know in all of their languages together and is comparable to the vocabulary of a monolingual peer.

Foundation 1.1 Understanding and Using Vocabulary

Early 3 to 4 ½ Years

Understand and use words for objects, actions, and attributes frequently experienced in everyday life, such as through play, conversations, or stories.

Early Examples

■ A child hands a peer the trucks when the peer communicates in English, “I want to play with the trucks,” during play.

Later 4 to 5 ½ Years

Understand and use an increasing variety of words for objects, actions, and attributes experienced in everyday life, such as through play, conversations, or stories.

Later Examples

■ A child hands a peer the blue dump truck and digger but not the tractor or yellow dump truck when the peer communicates in English, “I want to play with the blue dump truck and the digger,” during play.

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Foundation 1.1 Understanding and Using Vocabulary

Early
3 to 4 ½ Years

Later
4 to 5 ½ Years

Early Examples (continued)

● A child shares in English to a teacher, “Um, I like to play with my superhero guy.” When the teacher replies, “Your superhero guy—tell me more about that,” the child explains, “He jumps up so high.”

While making cookies with play dough, a child explains in English and Punjabi to another child, “No, don’t eat them. They are ਕੱਚੀਆਂ.” (No, don’t eat them. They are raw.)

A child communicates in Vietnamese, “Tôi đang làm tòa lâu đài bằng gỗ” (I am making a wooden castle) to a peer while playing with blocks.

A child comments in Hmong to a peer, “Kuv nyiam koj lub tsho ntsuab!” (I like your green shirt!)

A child shows a teacher “train” on a communication card to request a story about steam trains.

Later Examples (continued)

● A child explains in English to a teacher, “Um, I like to play with my superhero guy.” When the teacher replies, “Your superhero guy—tell me more about that,” the child describes, “He sticks, he crawls, and he can jump higher than a huge skyscraper.”

A child comments in Spanish to a peer, “Mira los diamantes. ¡Cómo brillan! ¡La corona es mía porque yo soy el rey!” (Look at the diamonds. They are so shiny! The crown is mine because I’m the king!), while pointing at a crown during play.

When the teacher points to an image of the earth in a book and asks, “这是什么?” (What is this?), a child responds in Mandarin, “地球。它是一颗行星。” (The earth. It’s a planet.)



Supporting Vocabulary Growth and Development

Children learn words in the context of interactions with peers and adults through play, instructional activities, literacy experiences, and everyday routines. In addition to using an evidence-based language and literacy curriculum with playful activities that follow a specific scope and sequence, to support children in developing more advanced and precise vocabulary in English or in the child’s home language during everyday interactions and routines, teachers can:

- Narrate what children are doing and name objects they are playing with. Consistently associating words with actions and objects helps solidify children’s understanding of the words.
- Introduce children to new words as part of conversations and activities. For example, teachers can use words to describe categories (such as “mammals” or “flower”) during science activities and vocabulary to describe shapes, relative size (such as “longest”), and position of an object (such as “on top” or “in between”) during math activities.
- Prior to planned learning activities, introduce new vocabulary using pictures, objects, or actions. For example, before a science activity building machines, teachers can introduce new objects, such as pulleys or levers, with their real names.
- Engage children in picture books, storytelling, and informational books. Teachers can select materials that relate to children’s own experiences, interests, or topics from the curriculum. Children may need to experience the same materials multiple times to learn the meaning of new words.
- Work with families and communities to support vocabulary learning in children’s home languages. Encourage family members to read books, sing songs, and tell stories in the home language. Family members can also help teachers learn to understand or communicate a few key words related to classroom activities in order to support the child in the classroom.



Foundation 4.4 Writing to Represent Words or Ideas

Early 3 to 4 ½ Years

Write using scribbles that resemble letters or characters and are distinct from pictures.

Later 4 to 5 ½ Years

Write a few recognizable letters or characters to represent words or ideas.

Children’s early writing includes drawing and dictation in addition to letters and characters.

If learning two different writing systems (such as Chinese characters and the Vietnamese alphabet), the child may write in a distinct style to represent each language.

Early Examples

■ A child writes squiggly lines across a paper, then communicates in English to the teacher, “I wrote a note for you!” The teacher replies, “Thank you! Can you read it to me?” The child responds, “It says, ‘I love you, Miss Tia.’”

● A child who primarily experiences print in Chinese draws blocky shapes, pointing to them and speaking out loud in Mandarin.

A child draws lines resembling letters under a picture they have drawn. They point to the letters and communicate in Tagalog, “Trak” (truck).

Later Examples

■ Asking the teacher to spell the words letter by letter, a child writes in English “I LOVE YOU” above a drawing of the child and the teacher. (In cases like this one, the child may not put spaces between words and may break up other words across lines or by changing direction.)

● A child uses their index finger to write the character “三” (three) with crooked lines in a tray of flour, then communicates to a peer in Mandarin, “我弟弟马上就三岁了。” (My brother is going to be three soon.)

During play, a child pretends to write a menu using a mix of letters and scribbles.

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Foundation 4.4 Writing to Represent Words or Ideas

Early
3 to 4 ½ Years

Later
4 to 5 ½ Years

Early Examples (continued)

A child makes scribbles with spaces in between them to resemble words in a sentence of alphabetic text in English.

Later Examples (continued)

A child draws a picture resembling two people. They write their own name at the top, then copy a peer's name by looking at the label on the peer's cubby, writing some of the letters backward or illegibly. The child communicates in Spanish, "*Mira, maestra. Somos yo y mi mejor amigo.*" (Look, teacher. It's me and my best friend.)



Supporting Children's Early Writing

Writing is a complex endeavor for which many different foundational skills are needed: fine motor skills, working memory, an understanding of print, and letter–sound correspondence. Young children make significant strides in their writing development, progressing from unrecognizable scribbles to recognizable letters or characters. Young children typically learn to write uppercase letters before lowercase letters. Teachers can support children's early writing skills through active, play-based learning activities, provided in an evidence-based literacy curriculum that follows a specific scope and sequence as well as during everyday interactions and routines.

Teacher can:

- Make writing a playful experience by using a variety of materials and surfaces, for example, writing with fingers in foam or sand, writing with sidewalk chalk on the ground, or using cotton swabs to write in paint.
- Support children's development of fine motor skills through play. Working with play dough, cutting with child-safe scissors, lacing beads, playing with tongs or oversized tweezers, using water pipettes, and decorating with stickers or sequins are all ways children continue to develop the motor skills needed to write.
- Incorporate writing into daily routines so children learn that writing can be used to represent thoughts and ideas. For example, when children share their thoughts in response to a question asked during circle time, teachers can write each child's response on a large easel next to their name, sounding out the words while writing them, even if the children are not yet expected to read the words.



- Model writing for children. Teachers might model both uppercase and lowercase letters during classroom activities and group writing activities (for example, when writing a group thank you letter to a classroom visitor). They may also use all uppercase letters when writing a word for a child to copy. For example, if a child asks for help labeling a drawing, a teacher can support the child's independent writing by printing the word in uppercase letters on a separate piece of paper, sounding out the word as they write, for the child to copy on their own. Children who are just beginning to learn to write letters may need additional support, such as line-by-line instruction or opportunities to trace letters.
- Provide writing materials for children to use during play. For example, a dramatic play area with toy food can have a small notepad or dry erase sheet that children can use as a menu or restaurant order pad.

Language and Literacy Development

English Language Development





Foundation 1.7 Asking Questions

Discovering

Use a frequently experienced question phrase (such as “What’s that?”) or use one or two English words with a rising pitch to ask questions.

Developing

Use a few question structures as a formula, filling in different words to ask about various topics.

Broadening

Use “who,” “what,” “why,” “how,” “when,” and “where” to produce questions in many forms to ask about a variety of topics in English.

Discovering Examples

■ A child holds out a firefighter’s hat and asks another child, “Want?”

● While pointing to a picture of a ladder in a picture book, a child asks, “What’s that?” The teacher explains, “That is called a ladder. It is like the ladder on the playground to get to the top of the slide.”

After a teacher asks, “What do you want with your lunch today?” a child asks, “Milk?” to request a carton of milk from a teacher while waiting to be served.

Developing Examples

■ A child asks another child in the block area, “You wanna play blocks?”
Later, the same child runs to the swings and asks another child, “You wanna play swings?”

● A child asks, “Is that a truck?” while gesturing at an image in a book about construction vehicles.

Broadening Examples

■ A child asks another child, “What do you want to play?”

● While looking at the pictures in a book with a peer, a child points at a purple train car and says, “I like the purple one. Which is your favorite?”

A child asks a peer, “Why you did that with the water?” when the peer pours water from a pitcher at the water table.

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Foundation 1.7 Asking Questions

Discovering

Developing

Broadening

Developing Examples

A child asks, “How do this work?” to learn about a new toy. Later, the child asks, “How do make applesauce?” while the class is making applesauce for a snack. The teacher leading the activity explains, “The first step to make applesauce is to peel the apples. I have this tool we can use. It’s called a peeler. Let me show you how it works.”

Broadening Examples

After a teacher asks a child about their painting of a tree and points out, “I see how you used the blue at the top for the sky,” the child asks, “How do you make the sun?” while painting at the easel.



Promoting Rich Language Use

Children learn from having opportunities to experience and use rich and varied language. Children learn English vocabulary and grammar from hearing stories in English, participating in extended conversations, listening to peers and adults, and having opportunities to share their thoughts and ideas in English that go beyond communicating needs or following simple directions. Through these interactions, they can practice and continue to develop communication skills in English. Teachers can promote rich language use in English in the following ways:

- Teachers can support children’s grammatical development by repeating and expanding on what children say, using grammatically complete sentences without directly correcting the child. For example, if a child communicates, “Want it,” a teacher might reply, “You want to use the markers?”
- During group activities, children can support each other’s language use. Teachers can pair children who are learning English with peers who are proficient in English. For example, in an activity where children are doing a scavenger hunt in pairs, teachers can have children who have different levels of English proficiency work together.
- Teachers can promote children’s use of English to communicate by modeling phrases they can use. For example, during a music lesson, a teacher can prompt a child, “You could ask him, ‘May I have a turn with the tambourine?’”



Strand: 2.0 — Foundational Literacy Skills

Sub-Strand — Phonological Awareness

Foundation 2.1 Recognizing and Segmenting Sounds

Discovering

Recognize and produce sounds of spoken English.

Developing

Match English words that have the same first sound in speech, with adult support or the support of pictures or objects.

Broadening

Isolate and pronounce the first sound of a word in English, with adult support or the support of pictures or objects.

Discovering Examples

■ While playing on their own, a child practices saying, “la la la, ra ra ra,” frequently pronouncing the two sounds in a way that sounds the same.

Developing Examples

■ During a class reading of a book about forest animals, the teacher asks, “Lion, giraffe, leopard— which words start with the same sound?” while pointing to the pictures. A child responds, “Lion, leopard!”

Broadening Examples

■ While the group eats lunch, the teacher says, “I see someone eating something that starts with a /l/ sound. Who is eating something that starts with /l/?” A child gestures at their lunch box and says, “Lentils!”

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■ ● Matching icons indicate alignment of examples across age-ranges



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Foundation 2.1 Recognizing and Segmenting Sounds

Discovering

Developing

Broadening

Discovering Examples

- As a teacher points to objects in a book and names them in English, a child repeats the words in English.

After a teacher reads the book *Llama Llama Red Pajama* aloud in English, the teacher explains in Spanish, “*¿Se dieron cuenta que cuándo leí el cuento dije /lama/? Pero en español decimos /yama/. Suenan diferente pero parecido.*” (Did you notice that when I was reading the story, I said /lama/? But in Spanish we say /yama/. They sound different but similar.” After this explanation, a child whose home language is Spanish practices saying “llama” over and over, alternating the English /l/ sound and Spanish /y/ sound (“/lama/ /yama/, /lama/ /yama/”).

Developing Examples

- While experiencing a picture book with a teacher, a child points to a picture of a snake and communicates, “It’s a snake.” The teacher responds, “Snake. /s/-/s/-snake. Can you find something else on this page that starts with the same sound as sssnake?” After some time, when the child does not answer the teacher prompts, “I see a /b/-/b/-branch, a /l/-/l/-leaf, and a /s/-/s/-snail. Which one has the same sound as /s/-/s/-snake?” The child points to the snail.

A Deaf child uses American Sign Language to communicate to a classmate, “Our names both start with the letter ‘N.’”

The teacher communicates, “I’m thinking of words that start with /m/. ‘Mouse’ starts with /m/. What else starts with /m/?” A child thinks for a moment, then communicates, “Mama.”

Broadening Examples

- While looking at a picture book with a teacher, a child points to a picture of a snake and communicates, “It’s a snake.” The teacher replies, “Snake. What sound does ‘snake’ start with?” The child responds, “/s/.”

A child draws a picture of a deer and tells a peer, “/d/ is for deer. Like me, Dmitry!”

When the teacher asks, “Can you find something that starts with /p/?” a child runs to a table and brings back a pencil and paper.

While trying to label a picture of a birthday cake they drew, a child asks the teacher which letter makes the /k/ sound at the start of “cake.”



Supporting Children’s Phonological Awareness Skills

Phonological awareness refers to a child’s awareness of the sounds of a language and the rules for combining those sounds into words. Before children can learn phonological awareness in English, they need familiarity with the sounds of English. Learning vocabulary and language use in English helps set the groundwork for phonological awareness. Teachers can support children’s understanding of English sounds and phonological awareness by providing explicit instruction while attending to the following:

- Teachers can sing songs, recite nursery rhymes, poems, and chants, and read aloud in English, allowing children to listen and join in.
- Languages have different sounds. For example, some languages do not have distinct /r/ and /l/ sounds, so words with these sounds will need to be said clearly and pointed out to children so they can practice recognizing and making those sounds.
- Children may need extra practice using sound combinations that do not exist in their home language. For example, not all languages use sounds that blend consonants together (such as /sm/ in “smell” or /sts/ in “forests”). Also, some languages do not have any words that end in a consonant sound. A child whose home language follows these rules, and does not have consonant blends, may initially pronounce the word “snack” as “su-na-cku” because they are applying the sound rules from their home language. To support children learning sounds and sound combinations in English, pronounce words clearly and give children authentic learning experiences with time to practice new sounds or provide opportunities for them to practice new words in the context of meaningful interactions.
- Phonological awareness skills transfer more or less from one language to another, so if a child already understands how to blend sounds or segment sounds in their home language, they will be able to apply those skills to familiar words in English.

California Preschool/
Transitional Kindergarten
**Learning
Foundations**

Mathematics



For Three-to-Five-and-a-Half-
Year-Old Children in Center-Based,
Home-Based, and TK Settings

Foundation 4.3 Comparing Two-Dimensional Shapes
**Early
3 to 4 ½ Years**

Compare two-dimensional shapes of different sizes and orientations to determine whether they are the same shape.

**Later
4 to 5 ½ Years**

Compare two-dimensional shapes of different sizes and orientations to determine whether they are the same shape. Identify similarities and differences in the properties (number of sides or vertices) of two different shapes.

Early Examples

■ When playing a matching game, a Deaf child uses American Sign Language to communicate that both shapes are squares.

● When playing Find the Shape, the teacher gives each child a shape and asks them to find that shape in the classroom. A child holding a circle cutout walks over to the clock and says in Arabic to a peer, “Circle!”

While playing in the block area, the teacher points to two rectangles and asks, “Are these the same shape?” A child turns the two rectangular blocks so the longest side is at the bottom, aligns them, and communicates, “Same!”

While playing Shape Hopscotch, a child jumps only on the triangle shapes to get from one side of the room to the other.

Later Examples

■ When playing a matching game, a Deaf child points to the three vertices of the first shape and signs, “This is a triangle because it is pointy at the top—see?” Then they point to the second shape and sign, “This one has four sides, so it is a rectangle.”

● When playing Find the Shape, a child pulls all the triangles, big and small, from around the classroom to one side and explains in Arabic to a peer, “These are all triangles because they have three sides.”

A child sorts pictures of various circles and rectangles into two groups. When the teacher asks why they sorted the pictures that way, the child explains in their home language that the round ones go together and the pointy ones go together.

Developing an Understanding of Two- and Three-Dimensional Shapes

Children can perceive the differences among various shapes from a very early age. In preschool, children learn to use key properties of a shape (for example, the number of corners or sides) to identify a shape. They also learn to combine shapes to make new shapes, patterns, and designs. In addition to using an evidence-based mathematics curriculum with playful activities that follow a specific scope and sequence, teachers can support children in developing an understanding of two- and three-dimensional shapes during everyday interactions and routines by:

- Providing open-ended materials that allow children to explore, sort, and build with a variety of two- and three-dimensional shapes. These materials can include blocks and tangrams as well as everyday items such as containers and cardboard boxes.
- Referring to shapes and encouraging the use of two- and three-dimensional shape names in everyday interactions.
- Inviting children to notice different representations of shapes in their environment, for example, going on a Shape Scavenger Hunt and finding examples of circles.
- Asking questions to encourage children to compare shapes and discuss their properties, for example, “How do you know this shape is a triangle?” “How are these two shapes different?” “How are they the same?”
- Presenting varied examples of each shape category, including less typical versions of a shape (for example, a scalene triangle, a square presented with the point down). For children to learn about the defining properties of a shape, they need to be exposed to many different versions of that shape. This will help them understand why one shape is a square and another is a rectangle, despite these two shapes having similar properties.
- Inviting children to create shapes in a variety of ways and compose shapes into new shapes, pictures, or designs. For example, teachers can ask, “How can we use these triangles to create a square?” “Can you make a flower using these shapes?”

California Preschool/
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**Learning
Foundations**

Science



For Three-to-Five-and-a-Half-
Year-Old Children in Center-Based,
Home-Based, and TK Settings

Strand: 5.0 — Engineering, Technology, and Applications of Science

Sub-Strand — Engineering Design

Foundation 5.1 Engineering Design Process

Early 3 to 4 ½ Years

Engage collaboratively with peers and adults in engineering design by identifying problems in play and everyday activities, planning and creating simple solutions to the problems they identify, and, with adult support, testing and refining their solutions.

Later 4 to 5 ½ Years

Engage collaboratively with peers and adults in engineering design by identifying problems in play and everyday activities, planning and creating more detailed solutions to the problems they identify, and testing and refining their solutions with less adult support and over longer periods of time.

Early Examples

■ After a teacher reads to the group about different types of buildings, a child with spina bifida builds a castle with wooden blocks with the teacher and adds a block with a slanted side, explaining to the teacher, “This is so wheelchairs can go up to the castle.”

● After noticing birds in the outdoor space, children communicate to their teacher that they want to feed the birds. The teacher helps children use paper rolls and twine to make simple birdfeeders to hang outside the classroom.

Later Examples

■ After a teacher reads to the group about different types of buildings, a child and a peer create their own city by first planning out their city in a drawing and then using magnetic tiles to build tall and short structures over a series of days.

● After noticing birds in the outdoor space, children communicate to their teacher that they want to build a bird feeder. The children draw how they want the bird feeder to look and, with adult support, build it over multiple weeks with materials brought in by families.

(continued on following page)

(continued)

Foundation 5.1 Engineering Design Process

Early
3 to 4½ Years

Early Examples (continued)

A child creates a walking path using logs and stepping stones in the outdoor space to get from the sidewalk to the sandbox without stepping on the grass. With the help of the teacher, the child changes the distance from one log or stepping stone to the next so that it is easy to step from one to the other.

After learning about Mae Jemison, the first Black female astronaut to go into space, a child creates a rocket out of cardboard paper rolls and construction paper, making adjustments with the help of a teacher, and pretends to be an astronaut.

Later
4 to 5½ Years

Later Examples (continued)

A teacher shares with children that some of their peers sometimes need quiet time and asks the children to brainstorm what they can do. Children suggest making a cozy corner. “What do we need for a cozy corner?” asks the teacher. The children suggest cushions, scarves, and a light from around the classroom. Over the next week, the children collaborate in making the cozy corner.

Crosscutting Concepts

As children engage in the engineering design process, they are likely to think about structure and function (for example, smooth ramps allow wheelchairs to roll, but stairs do not).

Supporting Children’s Exploration of Engineering and Technology

The engineering design process involves (1) identifying and defining engineering problems in everyday life, (2) developing solutions, and (3) testing and refining those solutions. Children explore how engineering and **technology** solutions help address their own and other people’s needs. To support children’s exploration of engineering and technology, teachers can:

- Provide opportunities for children to identify real-world problems they encounter in play and everyday interactions and support children in coming up with their own solutions. For example, teachers can involve children in building a dark room to explore light and shadow or in creating their own marble runs with a variety of materials.
- Give children ample time to implement, test, and refine their engineering design solutions. Allowing for the engineering design process to take place over multiple days or weeks provides children with opportunities to encounter challenges that they can solve collaboratively. For instance, teachers can support children in creating a representation of their neighborhood using wooden blocks over a series of days.
- Invite children to reflect on how design and technology solutions impact them, the people they know, and society at large (for example, exploring how different technologies help people communicate in different ways).
- Provide books and other media that show children how design solutions are used in everyday life (for example, books about bridges, housing structures from around the world, assistive technologies that support individuals with disabilities).
- Provide opportunities for children to participate in making by setting up making corners or makerspaces with materials, tools (used with adult support and oversight), loose parts, and books or artwork for inspiration for children to work on their own creations, individually and collaboratively.