

STEAM

Exploring STEAM at Home



Teacher Time

Use with Teacher Time Webinars

This booklet contains resources to help families encourage STEAM learning and use STEAM-related language and inquiry skills at home. Home visitors can also use these resources to support families in creating STEAM learning environments at home and supporting children's natural sense of wonder and curiosity about the world.



Teacher Time



STEAM



15-Minute
In-Service Suites
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ACTIVITIES FOR FAMILIES

STEAM IS ALL AROUND

Identify some areas in your home or household materials that you can use that promote your child's learning in the different STEAM domains.

<p>SCIENCE</p>	
	
<p>TECHNOLOGY</p>	
	
<p>ENGINEERING</p>	
	
<p>ART</p>	
	
<p>MATH</p>	
	

STEAM



15-Minute
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TIPS FOR FAMILIES

SPEAK THE LANGUAGE OF STEAM

The way parents speak to children can encourage inquiry, reflection, and problem solving. Speak STEAM in the home by including problem-solving and STEAM-rich language in all types of activities like cooking, playing with children's toys, or exploring outside!

USE THE FOLLOWING STEAM-RICH VOCABULARY

- Observe, observation
- Predict, prediction
- Investigate
- Discover
- Explain
- Similar/different
- Compare/contrast
- Measure
- Count
- Hypothesis/hypothesize
- Explore
- Experiment
- Test
- Record
- Guess

1. Use the STEAM-rich words listed above by first saying the word and then following up with simpler terms (e.g., first ask, "What do you **predict**?" Then rephrase, "What do you **think** will happen?"). Here are some examples of rephrasing!
 - "Let's **hypothesize** or guess which bath toy will sink or float?"
 - "I'm going to **record** or write down how tall you are!"
2. Introduce STEAM language as children explore their homes. Your child may understand STEAM ideas but need help developing the vocabulary to talk about what they know. Practice the example phases (adjust according to the situation):
 - "Let's **investigate** the size of these two cups!" or "Which cup do you **predict** will hold more blocks?"
 - "Let's **explore** the grass in our backyard! Is the grass all the **same**? Or is it **different** in some areas?"
3. Using scientific language with your child
 - extends and enriches STEAM experiences,
 - teaches advanced vocabulary in a meaningful context,
 - encourages the growth of STEAM content knowledge, and
 - supports your child's curiosity and exploration skills needed for later school success.
4. STEAM helps you provide your child with authentic learning experiences for using language and building communication skills. Children learn new content words in meaningful contexts. Here are some ways you can use STEAM language in your home environments:



Parent: Let's **count** how many blocks you can stack up without them falling. How many do you **predict** or think you can stack?



Parent: We did an **experiment** or **test** to see what toys would fit inside of your tube. You **predicted** or **thought** the basket would fit inside. Let's **record** or **write down** what we **observed** on our chart.

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TIPS FOR FAMILIES

IT'S OK TO BE CURIOUS!

Children have a natural sense of wonder and curiosity about the world. They like to explore, build, and question.

How can you support your child's curiosity? Encourage your child to observe objects and explore materials in new ways. You can do this anywhere and all throughout the day!

IN THE KITCHEN

- Grab a wooden spoon and flip over pots and pans to create drums.
- Count the beats out loud.



BATH TIME

- Guess whether objects will sink or float in the tub.
- Test your predictions by dropping them in!



BOOK READING

- Talk about colors, patterns, letters, and numbers in a book.
- Connect images to personal experience: "This dog is the same color as our dog!"



EVERYDAY MATERIALS

- Use a laundry basket to gather objects around the house and explore math concepts like comparing shape and sizes!
- Use math language: "The basket is bigger than your tunnel!"



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ACTIVITIES FOR FAMILIES

EXPLORE THE OUTDOORS TOGETHER

When children play outside in nature, it gives them the chance to explore their senses—by touching, seeing, smelling, hearing, and sometimes tasting things! They also learn to solve problems and observe the world around them. Researchers have found that when young children spend time outside in nature, it helps them learn.

HERE ARE SOME WAYS TO ENCOURAGE YOUR CHILD'S STEAM LEARNING WHILE EXPLORING TOGETHER OUTSIDE.

CHOOSE SOMETHING TO EXPLORE

Collect and explore different rocks or leaves; observe different insects, trees or plants.

- "Let's observe plants!"



I FOUND A LEAF!

OBSERVE AND ASK QUESTIONS

Describe what your child is looking at. Ask questions that let them explain what they see.

- You're touching the stem. It's long and thin.
- What does the dandelion smell like?
- Why do you think the dandelion turned white?

I WONDER WHAT
WILL HAPPEN WHEN
YOU BLOW ON THIS
DANDELION?

RECORD WHAT YOU EXPLORED

Document what you observed by doing one of the following:

- Draw a picture
- Create a journal
- Take a photo



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RESEARCH NOTES

LITTLE SCIENTISTS:

BUILDING EARLY STEAM SKILLS

STEAM learning is based on making observations, asking questions, making predictions, exploring, and reflecting. STEAM skills help us analyze information, think creatively, and solve problems. We use STEAM skills every day, from packing a car trunk to predicting how another person will react to a specific event.

THE TAKE HOME:

1. STEAM stands for Science, Technology, Engineering, Art, and Math. These topics are linked together because they rely on a common focus and approach.
2. STEAM is about asking questions and trying to figure out how things work.
3. Children naturally use STEAM skills to learn and explore their surroundings and make sense of the world.



WHAT DOES RESEARCH SAY?

- STEAM stands for Science, Technology, Engineering, Art, and Math. These topics are linked together because they rely on a common focus and approach. They all require gathering and using evidence to gain knowledge, create new things, and solve problems. **STEAM is about asking questions and trying to figure out how things work**, not about what facts you know.
- Infants and young children naturally use these STEAM skills to explore and learn about the world through play. Children act like scientists - they make observations and run experiments to see what will happen. In fact, more than half of children's natural playtime is spent playing a science or math-related activity.
- Research indicates that early STEAM skills provide a strong base for school readiness.



WHAT DOES IT LOOK LIKE?

- Children learn by exploring on their own, but they also depend on adults to guide their learning.
- You can help children enjoy STEAM by doing STEAM activities together. Early skills like creative thinking and problem solving establish the foundation for later learning and build confidence in STEAM areas.
- You don't need to know a lot about science or have special equipment to teach children about STEAM. Pay attention to what children are interested in—this is a great place to start! For example, a child might notice that his shirt got wet while he was washing his hands, and it feels heavier. Encourage the child to explore what types of things absorb water. Does a sponge or a block get heavier when you put it in water? Which one makes a better print on a piece of paper? Help parents practice asking open-ended questions like “Why might that be?” or “What else could we try?” Remember, STEAM is about asking questions and trying to figure out how things work – not which facts you know!
- Children naturally act like scientists. For example, an infant may predict that if she drops a toy, it will fall to the ground. She might then experiment with dropping different objects from different heights. Or, a child might explore different ways he can move his body patterns as he dances to music. He might try jumping to the beat of the music or moving his arms and legs in a coordinated way. Help parents recognize the observations, questions, and experiments their child does and think of ways to encourage their experiments and thinking.

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TRY THIS!

- Help children observe by asking, “What do you see?” Support curiosity by asking, “What do you want to know?” Extend children’s learning by saying, “What do you think will happen?” Support exploration by asking, “What should we try?” Help children reflect by asking, “What did you notice?” Encourage parents to notice and engage with what their children are exploring. Reflect on the kinds of STEAM play you observe in children and think about ways you can model STEAM skills in your interactions with families.
- Explore the outdoors and nature. You don’t need special equipment like microscopes to engage children in STEAM learning. Go outside or bring the outdoors inside! Nature is perfect for creative and active exploration and problem-solving. On home visits, help families find good spots to explore, whether it is the park down the street, or plants and trees around their home.
- Use materials that engage the senses. Explore with touch, smell, taste, sound, or sight. For example, bring different textured items on a home visit and have the child compare how objects feel. Observe which is rough, or squishy? After exploring, you might work together to create something new with the materials. This helps children use STEAM skills like making observations and creative thinking.

LEARN MORE:

NEWS YOU CAN USE: EARLY SCIENCE LEARNING FOR INFANTS AND TODDLERS

<https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/nycu-early-science.pdf>

COACHING CORNER: FULL STEAM AHEAD: USING PRACTICE-BASED COACHING TO SUPPORT THE TEACHING OF SCIENCE

<https://eclkc.ohs.acf.hhs.gov/video/full-steam-ahead-using-practice-based-coaching-support-teaching-science>

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CONNECTING AT HOME

LITTLE SCIENTISTS:

BUILDING EARLY STEAM SKILLS

STEAM stands for Science, Technology, Engineering, Art, and Math. Children use STEAM skills all the time when they wonder, explore, solve problems, and communicate. STEAM learning is based on making observations, creating, asking questions, and exploring. STEAM is all around us, ready to be discovered by young explorers.

USE YOUR SENSES

Explore with touch, smell, taste, sound, or sight. For example, help your child compare how objects feel. Which is rough, soft, smooth, or squishy? Together you can make observations about how something feels. After exploring, create something new with the materials. These skills are important for STEAM learning.

EXPLORE TOGETHER

A key part of helping your child enjoy STEAM is to do STEAM activities together. Children learn from other people, and they enjoy learning with others. For example, consider ways to make music as a group. Working together makes activities more meaningful and fun!

ASK QUESTIONS

Ask questions to guide your child's learning. Listen to their response. For infants, watch for their responses. Then expand upon it. It's ok if you don't know all the answers! It's not about right or wrong. The important thing is that you and your child observe, question, predict, explore, and reflect together.

LOOK OUTDOORS

Looking for STEAM inspiration? Try exploring outdoors! For example, you could ask "Do you see any birds? Let's see if we can find more! Where else might we see birds?" You don't have to go far to explore nature. If you live in a city, you can count bugs on the sidewalk or talk about the direction of the wind. You can also bring the outdoors inside by collecting leaves in the park.



STEAM

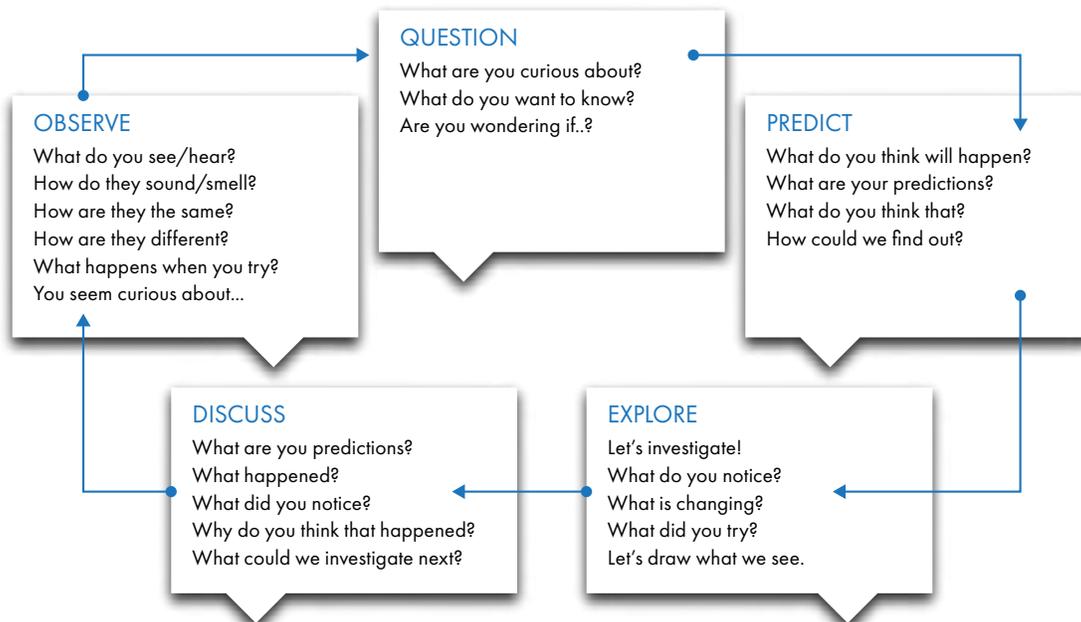
15-Minute
In-Service Suites
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TIPS FOR FAMILIES

THE INQUIRY CYCLE

The cycle of inquiry (or scientific method) is a thinking tool—not a specific activity. This tool helps us go through the process of questioning, exploring, predicting, discussing, and observing something of interest. Rather than focusing on learning scientific facts, when we take the time to observe things in our environment we become curious and begin to ask questions. Curiosity and asking questions (inquiry) is what helps children learn about the world around them. Inquiry builds critical thinking skills and supports problem solving across the domains of learning and development, which is key to children’s school readiness and independent learning throughout life.

This cycle doesn’t always move in one direction. Sometimes, you will move back and forth through the steps because your child might notice something new or realize he has a new question after exploring more. As your child explores your home and community, practice asking these questions to help your child learn more about the world around you.



- Encourage your child to ask questions in their home language whenever possible. Provide visual aids that your child can use to communicate their thinking
- Adjust your questions to match your child’s current level of receptive and expressive language and English.
- Allow your child to communicate in the language in which they feel most comfortable to support curiosity and questioning.
- Keep in mind if your child is a dual language learner, they may actively engage in play by listening to others’ observations but may not yet feel confident to respond in English.
- Children develop their comprehension and communication skills as they make predictions, plan explorations, describe findings, document observations and explain their reasoning (“Why did it happen?”). They also learn how to engage in small group conversations.

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TIPS FOR FAMILIES

A CULTURE OF INQUIRY

To create a culture of inquiry, notice what your child says and does—learn about the things they are interested in and what they know already! As you observe your child exploring their environment, you and your child become scientists together! A culture of inquiry includes all learners. Here are some ways to create a culture of inquiry.

MODEL A QUESTIONING MIND



Listen to your child's questions and ask open-ended questions that begin with:

- "I wonder what..."
- "I wonder how..."
- "I wonder why..."

EXPLORE TOGETHER



Let your child take the lead and explore his questions together. You don't need to have all the answers.

BE AN ACTIVE OBSERVER



Be an active observer to learn about your child's interests and abilities. Adapt your language and materials to build on your child's existing knowledge and understanding.

TALK WITH CHILDREN



Engage your child in conversation. Invite her to communicate by asking about her observations, developing questions, making predictions, etc.

KNOW WHEN TO INTERVENE



When you observe your child, decide when it is the appropriate time to ask a question or offer help without distracting or overwhelming your child with too much feedback.

PROVIDE CHILDREN WITH TIME



Give your child the opportunity to investigate and figure things out.

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LEARNING ACTIVITY FOR HOME VISITORS

STEAM IS ALL AROUND

For this learning activity, brainstorm areas in the home or household materials you can identify with parents to support them in promoting learning in different STEAM domains.

<p style="text-align: center; background-color: #00a651; color: white; padding: 2px;">SCIENCE</p> 	
<p style="text-align: center; background-color: #00a651; color: white; padding: 2px;">TECHNOLOGY</p> 	
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TIPS FOR HOME VISITORS

SPEAK THE LANGUAGE OF STEAM

The way parents speak to children can encourage inquiry, reflection, and problem solving. Encourage parents to speak STEAM in the home by incorporating problem-solving and STEAM-rich language in all types of activities like cooking, playing with children's toys, or exploring outside!

ENCOURAGE PARENTS TO USE THE FOLLOWING STEAM-RICH VOCABULARY:

- | | | |
|------------------------|--------------------------|--------------|
| ▪ Observe, observation | ▪ Similar/different | ▪ Explore |
| ▪ Predict, prediction | ▪ Compare/contrast | ▪ Experiment |
| ▪ Investigate | ▪ Measure | ▪ Test |
| ▪ Discover | ▪ Count | ▪ Record |
| ▪ Explain | ▪ Hypothesis/hypothesize | ▪ Guess |

- Encourage parents to use the STEAM-rich words listed above. Recommend they introduce the words to their child by first saying the word and then following up with simpler terms (e.g., first ask, “What do you **predict**?” then rephrase, “What do you **think** will happen?”). Use real objects, photographs and/or illustrations to help children learn the words for key vocabulary and concepts. For example, encourage parents to practice rephrasing:
 - “Let’s **hypothesize** or guess which bath toy will sink or float?”
 - “I’m going to **record** or write down how tall you are!”
- Encourage parents to introduce STEAM language as children are exploring their homes. Remind them that children may understand STEAM concepts but need help developing the vocabulary to talk about what they know. For children who are dual language learners, provide key words and concepts in English and their home languages, when possible. Have parents practice the example phrases (adjust according to the situation):
 - “Let’s **investigate** the size of these two cups!” or “Which cup do you predict will hold more blocks?”
 - “Let’s **explore** the grass in our backyard! Is the grass all the same? Or is it different in some areas?”
- Share with parents how using scientific language with their child
 - extends and enriches STEAM experiences,
 - teaches advanced vocabulary in a meaningful context,
 - encourages the growth of STEAM content knowledge, and
 - supports their child’s curiosity and exploration skills needed for later school success.

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4. STEAM helps parents provide their children with authentic learning experiences for using language and building communication skills. Children learn new content words in meaningful contexts. Here are some ways you can encourage parents' use of STEAM language and environments:



Parent: Let's **count** how many blocks you can stack up without them falling. How many do you **predict** or **think** you can stack?

Home visitor: You're promoting STEAM learning by having your child guess how many blocks they can stack!



Parent: We did an **experiment** or **test** to see what toys would fit inside of your tube. You **predicted** or **thought** the basket would fit inside. Let's **record** or **write down** what we observed on our chart.

Home visitor: You're promoting STEAM learning by allowing your child to explore the different sizes of items in his house!

STEAM

RESEARCH NOTES

LITTLE SCIENTISTS:

BUILDING EARLY STEAM SKILLS

STEAM learning is based on making observations, asking questions, making predictions, exploring, and reflecting. STEAM skills help us analyze information, think creatively, and solve problems. We use STEAM skills every day, from packing a car trunk to predicting how another person will react to a specific event.

THE TAKE HOME:

1. STEAM stands for Science, Technology, Engineering, Art, and Math. These topics are linked together because they rely on a common focus and approach.
2. STEAM is about asking questions and trying to figure out how things work.
3. Children naturally use STEAM skills to learn and explore their surroundings and make sense of the world.



WHAT DOES RESEARCH SAY?

- STEAM stands for Science, Technology, Engineering, Art, and Math. These topics are linked together because they rely on a common focus and approach. They all require gathering and using evidence to gain knowledge, create new things, and solve problems. **STEAM is about asking questions and trying to figure out how things work**, not about what facts you know.
- Infants and young children naturally use these STEAM skills to explore and learn about the world through play. Children act like scientists - they make observations and run experiments to see what will happen. In fact, more than half of children's natural playtime is spent playing a science or math-related activity.
- Research indicates that early STEAM skills provide a strong base for school readiness.



WHAT DOES IT LOOK LIKE?

- Children learn by exploring on their own, but they also depend on adults to guide their learning.
- You can help children enjoy STEAM by doing STEAM activities together. Early skills like creative thinking and problem solving establish the foundation for later learning and build confidence in STEAM areas.
- You don't need to know a lot about science or have special equipment to teach children about STEAM. Pay attention to what children are interested in—this is a great place to start! For example, a child might notice that his shirt got wet while he was washing his hands, and it feels heavier. Encourage the child to explore what types of things absorb water. Does a sponge or a block get heavier when you put it in water? Which one makes a better print on a piece of paper? Help parents practice asking open-ended questions like “Why might that be?” or “What else could we try?” Remember, STEAM is about asking questions and trying to figure out how things work – not which facts you know!
- Children naturally act like scientists. For example, an infant may predict that if she drops a toy, it will fall to the ground. She might then experiment with dropping different objects from different heights. Or, a child might explore different ways he can move his body patterns as he dances to music. He might try jumping to the beat of the music or moving his arms and legs in a coordinated way. Help parents recognize the observations, questions, and experiments their child does and think of ways to encourage their experiments and thinking.

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TRY THIS!

- Help children observe by asking, “What do you see?” Support curiosity by asking, “What do you want to know?” Extend children’s learning by saying, “What do you think will happen?” Support exploration by asking, “What should we try?” Help children reflect by asking, “What did you notice?” Encourage parents to notice and engage with what their children are exploring. Reflect on the kinds of STEAM play you observe in children and think about ways you can model STEAM skills in your interactions with families.
- Explore the outdoors and nature. You don’t need special equipment like microscopes to engage children in STEAM learning. Go outside or bring the outdoors inside! Nature is perfect for creative and active exploration and problem-solving. On home visits, help families find good spots to explore, whether it is the park down the street, or plants and trees around their home.
- Use materials that engage the senses. Explore with touch, smell, taste, sound, or sight. For example, bring different textured items on a home visit and have the child compare how objects feel. Observe which is rough, or squishy? After exploring, you might work together to create something new with the materials. This helps children use STEAM skills like making observations and creative thinking.

LEARN MORE:

NEWS YOU CAN USE: EARLY SCIENCE LEARNING FOR INFANTS AND TODDLERS

<https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/nycu-early-science.pdf>

COACHING CORNER: FULL STEAM AHEAD: USING PRACTICE-BASED COACHING TO SUPPORT THE TEACHING OF SCIENCE

<https://eclkc.ohs.acf.hhs.gov/video/full-steam-ahead-using-practice-based-coaching-support-teaching-science>

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CONNECTING AT HOME

LITTLE SCIENTISTS:

BUILDING EARLY STEAM SKILLS

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USE YOUR SENSES

Explore with touch, smell, taste, sound, or sight. For example, help your child compare how objects feel. Which is rough, soft, smooth, or squishy? Together you can make observations about how something feels. After exploring, create something new with the materials. These skills are important for STEAM learning.

EXPLORE TOGETHER

A key part of helping your child enjoy STEAM is to do STEAM activities together. Children learn from other people, and they enjoy learning with others. For example, consider ways to make music as a group. Working together makes activities more meaningful and fun!

ASK QUESTIONS

Ask questions to guide your child's learning. Listen to their response. For infants, watch for their responses. Then expand upon it. It's ok if you don't know all the answers! It's not about right or wrong. The important thing is that you and your child observe, question, predict, explore, and reflect together.

LOOK OUTDOORS

Looking for STEAM inspiration? Try exploring outdoors! For example, you could ask "Do you see any birds? Let's see if we can find more! Where else might we see birds?" You don't have to go far to explore nature. If you live in a city, you can count bugs on the sidewalk or talk about the direction of the wind. You can also bring the outdoors inside by collecting leaves in the park.





CREATING A CULTURE OF INQUIRY IN THE HOME-BASED SETTING

To create a culture of inquiry, adults must use observations about what children say and do to learn about their interests and current understandings. This allows adults and children to become scientists together. A culture of inquiry includes all learners. Here are some ways to create a culture of inquiry.

MODEL A QUESTIONING MIND



- Encourage parents to listen to their child's questions and ask open-ended questions that begin with:
 - "I wonder what..."
 - "I wonder how..."
 - "I wonder why..."
- Have a child speak in the language(s) in which he feels most comfortable to support curiosity and questioning

EXPLORE TOGETHER



- Parents don't need to have all the answers. Instead, encourage parents to let their child take the lead and guide them in exploring their questions. Offer many opportunities for interactive- and exploration-based learning and encourage parents to learn with their children.

BE AN ACTIVE OBSERVER



- Encourage parents to be active observers to learn about their child's interests and abilities. Parents should adapt their language and materials to build on their child's existing knowledge and understanding.
- A child may express her curiosity non-verbally through her facial expressions, body language, and behaviors.

TALK WITH CHILDREN



- Have parents practice engaging their child in conversation in the home language they are most comfortable speaking to encourage, prompt, and expand their child's vocabulary for describing observations, developing questions, and making predictions.
- Visual supports such as pictures and books can give parents and children another way to communicate, besides verbal communication.

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KNOW WHEN TO INTERVENE



- Help parents decide when it is the appropriate time to ask a question or offer help without distracting or overwhelming their child with too much feedback.

PROVIDE CHILDREN WITH TIME



- Encourage parents to give their child the opportunity to investigate and figure things out.

STEAM

NOTES

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NATIONAL CENTER ON

Early Childhood Development, Teaching and Learning