

# STEAM

Speaking the Language of STEAM



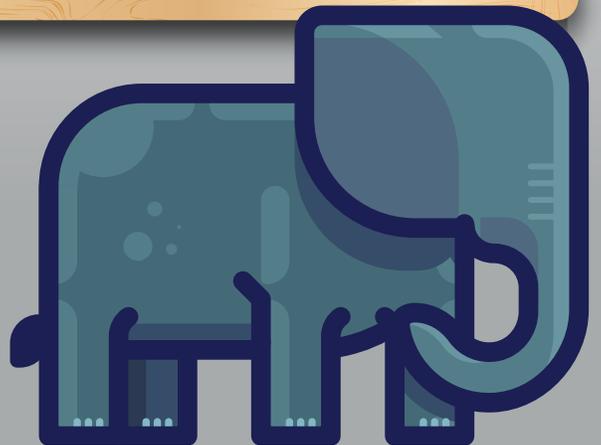
Teacher Time

Use with Teacher Time Webinars

This booklet includes resources to help education staff use STEAM-related language and vocabulary with infants, toddlers, and preschoolers. Resources provide strategies for engaging children in conversations and supporting children's curiosity about the world around them.



Teacher Time



# STEAM



15-Minute  
In-Service Suites  
STEAM

TIPS FOR EDUCATION STAFF

## SPEAK THE LANGUAGE OF STEAM

The way adults speak to children can encourage inquiry, reflection, and problem solving. Speak STEAM by incorporating problem-solving and STEAM-rich language in all types of activities.

### EXAMPLE STEAM VOCABULARY

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

- Children may understand STEAM concepts but need help developing the vocabulary to talk about what they know. Introduce STEAM language as children explore their environments. For children who are dual language learners, provide key words and concepts in English and their home language, when possible.
- After introducing vocabulary, follow with simpler terms (e.g., first ask, “What do you **predict**?” then rephrase, “What do you **think** will happen?”). Use real objects, photographs, or illustrations to help children learn the words for key vocabulary and concepts.
- Using scientific language
  - extends and deepens STEAM experiences,
  - teaches advanced vocabulary while letting children see the vocabulary in action,
  - encourages the growth of STEAM content knowledge, and
  - supports children’s curiosity and exploration skills needed for later school success.
- STEAM provides children with real-life learning experiences for using language and building communication skills. Children learn new content words in meaningful contexts.



Teacher: Let’s **investigate** or **look at** the corn we harvested! **Observe—smell and feel**—the two ears of corn. How are they **similar** or **alike**?



Teacher: We did an **experiment** or **test** to see if the objects will sink or float. You **predicted** or **thought** the spoon would sink. Let’s **record** or **write down** what we **observed** on our chart.

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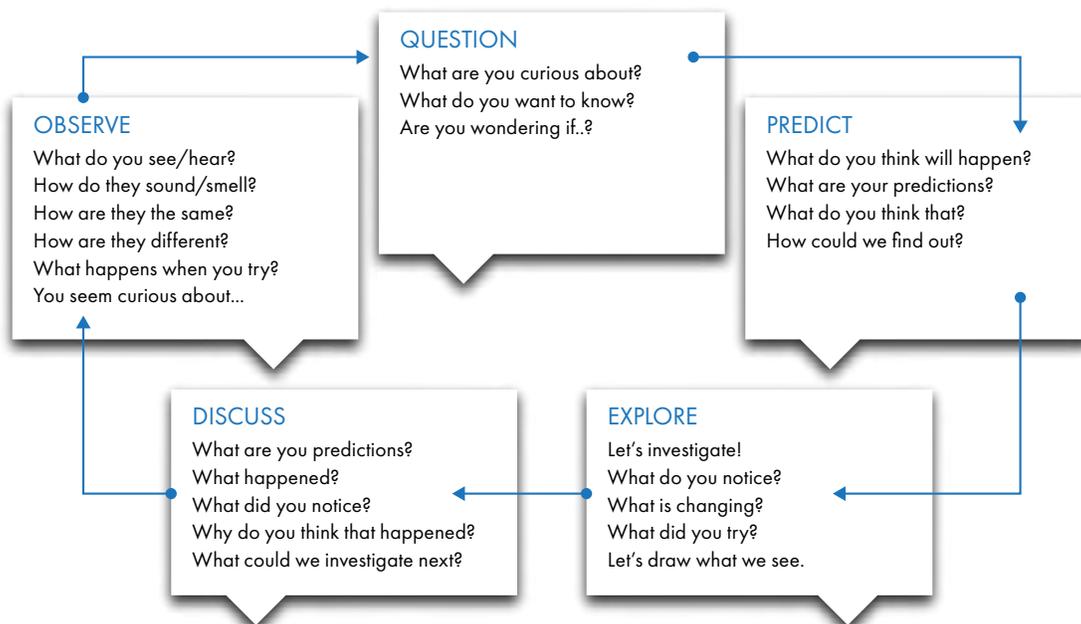
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## THE INQUIRY CYCLE

The cycle of inquiry (or scientific method) is a thinking tool—not a specific activity. This tool leads us 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.

The inquiry cycle is not always straightforward. We move back and forth through the steps because we might notice something new or realize we have a new question after exploring more. Practice asking the following questions with children to help them learn about their world.



- Encourage children to ask questions in their home languages whenever possible. If you do not know the home language, provide visual aids that children can use to communicate their thinking.
- Adjust your questions to match a child’s current level of receptive and expressive language and/or English.
- Allow children to communicate in the language(s) in which they feel most comfortable to support curiosity and questioning.
- Keep in mind that children who are dual language learners may be actively engaged 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 conversation.

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## LEARNING ACTIVITY ASKING QUESTIONS

### Birth to Five

### PLANNING QUESTIONS THAT EXTEND CONVERSATION—INFANTS AND TODDLERS

**Directions:** Identify which age group you work with: young infants, older infants, or toddlers. Then **modify** each question below to create a meaningful question that engages a child in an extended conversation. For each of the six questions, write down at least one example of how the question can be modified to promote children's thinking skills and encourage them to communicate their ideas.

Did you make a tall tower?	
Is that a fish swimming in the water?	
Have you seen a truck like this before?	
What color did you use to paint your picture?	
Are you ready to go outside and play?	
Did you have fun splashing the water with your hand?	



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FALL 2014

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## TIPS FOR TEACHERS ASKING QUESTIONS



### WAYS TO ASK OLDER INFANTS AND TODDLERS QUESTIONS

Asking questions is an important way to extend conversations. For older infants and toddlers, watch for their responses in facial expressions, gestures, and body language, and listen for vocalizations as well as words. For this age group, focus on asking more open-ended questions to extend their language and thinking. Remember to match their pace—wait for their responses before commenting or asking more questions!

The first column below lists strategies for asking questions. The second column provides examples of questions you might ask.

Ask children about what they see, do, and feel.	<ul style="list-style-type: none"> <li>• Where are you going to play next?</li> <li>• What do you see on this page?</li> </ul>
Ask questions that help children connect with their own lives.	<ul style="list-style-type: none"> <li>• Let's look at this family photo album together. Who do you see in these photos?</li> <li>• Where should we hang your picture?</li> <li>• You're rubbing your eyes. How do you feel?</li> </ul>
Ask children to make predictions.	<ul style="list-style-type: none"> <li>• What do you think will happen if you put one more block on top of the tower?</li> <li>• What will the caterpillar eat next? (<i>The Very Hungry Caterpillar</i>)</li> </ul>
Ask children to explain something or solve a problem.	<ul style="list-style-type: none"> <li>• What can we use this box for?</li> <li>• Why do you think the block tower fell down?</li> <li>• How can we bring all of these balls outside?</li> </ul>



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## TIPS FOR TEACHERS ASKING QUESTIONS



### WAYS TO ASK YOUNG INFANTS QUESTIONS

Asking questions is an important way to extend conversations, even for young infants! Whether you ask open- or closed-ended questions, you are engaging in a back-and-forth exchange that involves young infants in the sounds and rhythms of language. And that deepens your relationship with them at the same time.

The first column below lists strategies for asking questions. The second column provides examples for each strategy.

<p>Ask, wait, watch, and wonder!</p>	<ul style="list-style-type: none"> <li>• Ask a question. Use your body language, tone, and facial expressions to animate the question.</li> <li>• Slow down your speech so that the infant can follow you.</li> <li>• Wait for a response. Watch for facial expressions, gestures, and body language. Listen for vocalizations such as coos, squeals, and babbling.</li> <li>• What is the infant trying to tell you? Respond back using similar vocalizations and facial expressions.</li> <li>• Repeat!</li> </ul>
<p>Ask children about what they see, do, and feel.</p>	<ul style="list-style-type: none"> <li>• You're reaching for the ball. What are you going to do with it?</li> <li>• Where are you crawling to?</li> <li>• How can you make the rubber ducky squeak?</li> <li>• Which book shall we read today?</li> <li>• Let's look out the window. What do you see?</li> </ul>
<p>Ask questions that help children connect with their own lives.</p>	<ul style="list-style-type: none"> <li>• Let's look at this family photo album together. Who is holding you?</li> <li>• Where is your belly?</li> <li>• Are you letting me know you want me to pick you up?</li> <li>• Which bib would you like me to put on you—the smooth one or the soft one?</li> </ul>



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## TIPS FOR TEACHERS NOVEL WORDS

### Birth to Five INTRODUCING NOVEL WORDS TO OLDER INFANTS AND TODDLERS

One important way to extend and improve the quality of conversations with older infants and toddlers is to introduce them to new and interesting words that will grow their receptive language skills and vocabularies. This takes planning and intentionality.

#### Strategies for introducing a broad vocabulary of meaningful words

##### Identify new, interesting, and playful words:

- Brainstorm with colleagues and the children’s families for words that relate to the children’s home lives and the program’s routines and play experiences.
- Consult children’s books, poems, songs, chants, rhymes, and finger plays for rich vocabulary words and word play.
- Use a dictionary or thesaurus to find alternative words for children’s routines and play experiences (nap, rest, and sleep, for example).
- Identify words in the children’s home languages and in English.

##### Communicate within the context of a warm relationship:

- Make interactions nondirective and personal.
- Be responsive to what the child needs and is learning.
- Be an active listener; wait for the child’s response. Then respond to what you think the child is trying to tell you (both verbally and nonverbally), and fill in non-specific phrases with rich vocabulary.
- Be aware of words and concepts that a child understands and build on these with new and interesting words.

##### Provide a vocabulary-rich environment:

- Offer a stimulating environment that invites young children to actively explore and inspires conversations.
- Select words that are useful in everyday interactions and experiences.
- Expose older infants and toddlers to interesting and novel words when talking to them during routines and play experiences.
- Use rich vocabulary when responding to children’s facial expressions, gestures, body language, and vocalizations.



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## TIPS FOR TEACHERS NOVEL WORDS



### INTRODUCING NOVEL WORDS TO YOUNG INFANTS

For young infants, all words are novel words! One important way to extend and improve the quality of communications with young infants is to introduce them to new and interesting words that enhance their receptive language skills. This takes planning and intentionality.

#### Strategies for introducing a broad vocabulary of meaningful words

##### Communicate within the context of a trusting relationship:

- Make interactions warm and personal, not just directive (“do this” “don’t do that”).
- Be responsive to what the infant needs, feels, and is learning.
- Be an active listener; wait for the infant’s response before responding.
- Be aware of words and concepts that a child understands and build on these with new and interesting words.

##### Support language development:

- Use infant-directed speech (or example, elongated vowel sounds and exaggerated pauses between words) to nurture emotional bonding and to help infants pay attention to the sounds and structure of words.
- Repeat new words many times in many contexts.
- Use descriptive language to narrate what infants do, see, and feel.
- Focus on conversational rather than directive speech.

##### Provide a vocabulary-rich environment:

- Offer a stimulating environment that invites young children to actively explore and inspires conversations.
- Select words that are useful in everyday interactions and experiences.
- Expose young infants to interesting and novel words when talking to them during routines and play experiences.
- Use rich vocabulary when responding to infant’s facial expressions, gestures, body language, and vocalizations.



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## LEARNING ACTIVITY ASKING QUESTIONS

### Birth to Five

### PLANNING QUESTIONS THAT EXTEND CONVERSATION—PRESCHOOLERS

**Directions:** Modify each question below to create a meaningful question that engages a child in an extended conversation. For each of the six questions, write down at least one example of how the question can be modified to promote children's expression of ideas and higher level thinking skills.

Did you make a tall tower?	
Is that a dolphin swimming in the water?	
Have you seen a tool like this before?	
What color did you use to paint your picture?	
Are you ready to go outside to play?	
Did you have a good morning?	



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## TIPS FOR TEACHERS ASKING QUESTIONS



### WAYS TO ASK PRESCHOOL CHILDREN QUESTIONS

Asking questions is an important way to extend conversations with children in the classroom. The first column below contains four strategies for extending conversations with questions. The second column provides examples for each strategy.

<p>Ask children about what they are doing.</p>	<ul style="list-style-type: none"> <li>• What are you working on?</li> <li>• You are working very hard, tell me about your project.</li> <li>• What are your plans for those materials?</li> </ul>
<p>Ask children to provide explanations.</p>	<ul style="list-style-type: none"> <li>• Why do you think that happened?</li> <li>• How can I help you solve this problem?</li> <li>• I am wondering, how did you do that?</li> </ul>
<p>Ask children to make predictions.</p>	<ul style="list-style-type: none"> <li>• What do you think will happen next?</li> <li>• What could we use this container for?</li> <li>• What would you do if that were you?</li> </ul>
<p>Ask children to connect learning to their own lives.</p>	<ul style="list-style-type: none"> <li>• What do you think about...?</li> <li>• How did you do that before?</li> <li>• What does this remind you of?</li> </ul>



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## TIPS FOR TEACHERS NOVEL WORDS

Birth to Five

### INTRODUCING NOVEL WORDS TO PRESCHOOLERS

One way to extend conversations with children in the classroom is by incorporating novel words. Here are several strategies for including novel words in conversations.

#### Incorporating novel words takes planning.

- Identify novel words:
  - » Brainstorm with colleagues.
  - » Search children's books, poems, and songs.
  - » Use a thesaurus to find alternative ways to say the same word.
- Select materials that expand children's vocabulary:
  - » Small vehicle sets (e.g., ambulance, crane, helicopter)
  - » People figures (e.g., astronaut, pediatrician, chef)
  - » Everyday materials in dramatic play (e.g., colander, stethoscope, helmet)
  - » Children's books
- Create child-friendly definitions in advance:
  - » Simple
  - » Focus on attributes
  - » No unfamiliar words

#### Incorporating novel words takes intentionality.

- Select words that are important for comprehension and useful in everyday interactions.
- Allow for spontaneous conversations with children and use novel words in these conversations.
- Model rich vocabulary in responses to children.
- Be aware of the words a child already understands and add novel words that build on familiar concepts.
- Expose children to novel words and have conversations with children during any activity during the day like: meal time, circle time, story time, free play experience, and dramatic play.



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