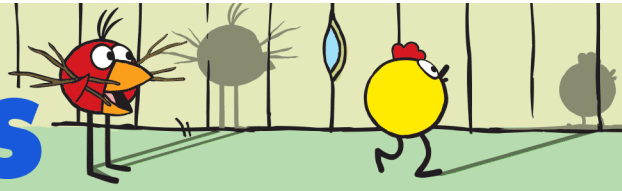




# Explore SHADOWS



## Teaching Strategies Science Talk

### What Is Science Talk?

- **Language is crucial to learning and communication** in all subjects. Science is no exception. As children investigate and explore shadows, they need to talk about their work just the way scientists would—this is "science talk."
- **Science talk happens when** children ask questions, make comparisons and predictions, share and discuss results, and learn new words to describe what they are seeing and doing.

#### Examples:

*I think that tree is blocking my shadow.*

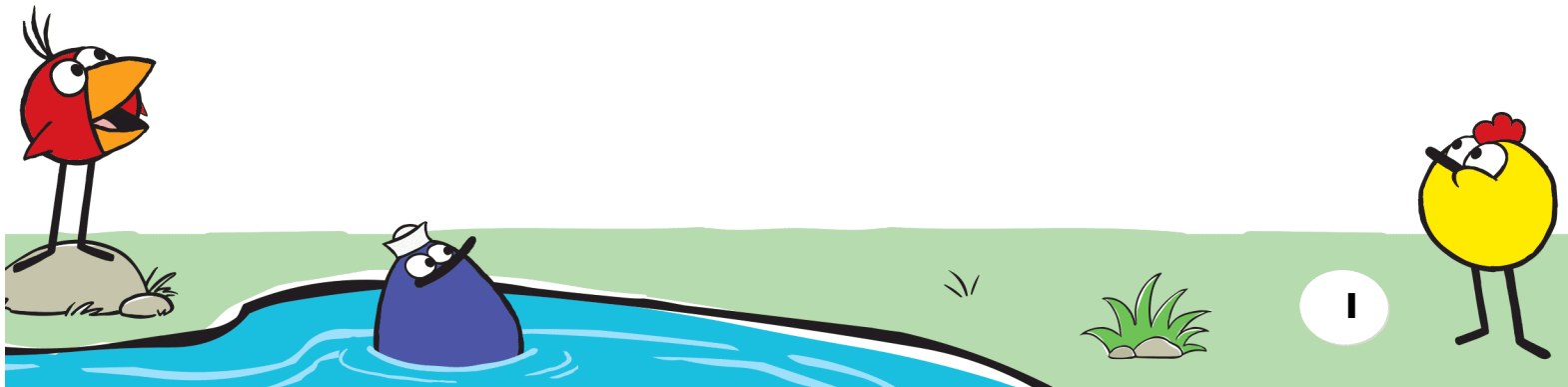
*I can see my shadow over here, but I can't see it over there.*

*The shadow looks fuzzy when I pull my hand farther away.*

- **One misconception** educators sometimes have is that science talk needs to sound "scientific." As you can see from the examples above, that's not always the case—but they clearly show a child's active and curious mind predicting, observing, and making distinctions.
- **Science talk can happen any time and any place**—not just during science explorations. It happens during snack time as children compare amounts of water in their cups or the colors of their apples. It happens outside on the playground as children inspect an anthill or crunch leaves.

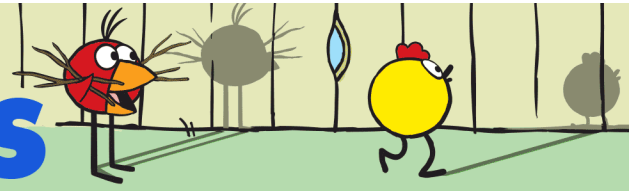
### Why is science talk important?

- **Language is a tool for thinking and learning as well as communicating.** When children use science talk, it helps them develop understanding, share ideas, build vocabulary, and increase their listening and comprehension skills.
- **Science talk helps children to go deeper in their science explorations,** by encouraging them to think through an idea, ask a new question, or try something new. Science talk is not just a way of communicating—it is part of how we think and learn about the world.





# Explore SHADOWS



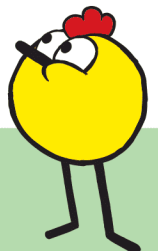
## Teaching Strategy: Modeling Science Talk

### Why is modeling science talk an effective teaching strategy?

- By modeling how to pose questions, keep a discussion going, or how to narrate your actions and thoughts, you help develop children's abilities to listen, reflect, and communicate.
- You also help them build vocabulary and discover the power and importance of words.

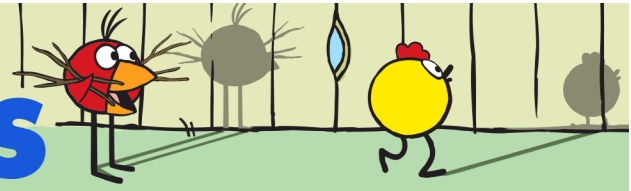
### Here are some ways to model science talk while exploring shadows.

- **Compare and contrast shadows you notice throughout the day.**  
**Example:** *Look, I can see my shadow on the wall. I couldn't see it there when I looked this morning. Why do you think I can see it now? Why couldn't I see it before? I'm curious if I'll be able to see my shadow at this time tomorrow. What do you think?*
- **Let children know what you're wondering about.**  
**Example:** *You might hold up a flashlight and say, I wonder if I can use this flashlight to make a shadow of my hand on the ceiling? Where should I hold the flashlight in order to make that shadow? How can I figure out where to hold the flashlight?*
- **Incorporate new words as children do hands-on activities.**  
**Example:** *You might introduce the word position as you make shadows with a flashlight or lamp. Look, I changed the position of the flashlight and the shadow grew bigger! Why do you think that happened?*
- **Narrate your actions so children learn to describe aloud what they are doing.** Use action words such as *observe, describe, notice, predict, compare, change, discover, record, and measure*. Use descriptive words such as *near, far, smaller, bigger*.  
**Example:** *You might say, I wonder if I can make this block shadow smaller? What will happen if I move the flashlight farther away from the block? When you investigate more closely, children will be encouraged to do the same.*





# Explore SHADOWS



- **Use rich, descriptive language.**  
**Example:** Encourage children to be detailed in their observations of shadows. Model this by saying things like, *Look! This bowl is making a round shadow. This shadow has no edges and it's a circle. It looks like a ball.*

## Your Experiences

- Can you share some of your own stories about modeling science talk? What's been successful? What's been a struggle?
- What are some ways you've encouraged children to enrich their language and incorporate science vocabulary?
- What did you learn from the video that you might try in your own teaching?

## Teaching Strategy: Asking Open-Ended Questions

### *How does asking open-ended questions encourage science talk?*

- An open-ended question is one that usually can't be answered with just one or two words, or with a simple *yes* or *no*. They are phrased in a way that encourages children to explain and expand upon their thoughts.
- As children answer open-ended questions, they build expressive language skills, reflect on what they're observing, and go deeper into their explorations.

### *Composing open-ended questions takes a little practice.*

- Most people discover that it's an acquired skill.
- It's a good idea to come prepared with a list of such questions when leading a science activity, until it becomes a natural part of your teaching.

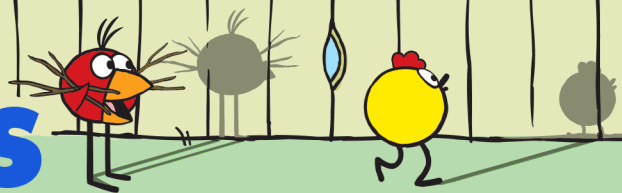
### *Some examples:*

- **How questions:** *How do you think I can make my shadow disappear? How much longer is this shadow than that shadow? How can you tell?*





# Explore SHADOWS



- **What questions:** *What would happen if you moved the block farther from the light? What are some ways you can change the shape of this shadow? What do you think will happen to your shadow if the sun goes behind a cloud?*
- **Do you think . . . questions:** The use of “Do you think...” when relevant, encourages children’s thinking—instead of focusing on getting the right answer. *What do you think my shadow will look like at night? Do you think this glass can make a shadow?*

## Open-ended questions aren’t always the answer.

- Keep in mind that they aren’t always the best choice in all situations and for all children. Some children may need more structure and guidance.  
**Example:** Instead of asking, *Can you describe how the shadow changed?*, you might get more from some children by asking an either/or question: *Do you think your shadow will grow or shrink if you move closer to the wall?* That way, they begin to learn to make distinctions and comparisons.

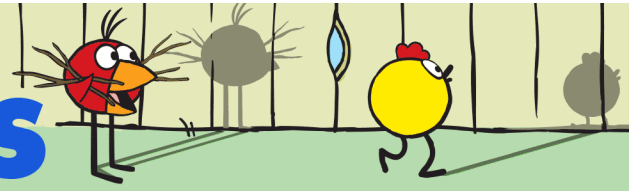
## Your Experiences

- Do you intentionally use open-ended questions with children? What’s your experience been?
- What differences have you noticed in the way children answer when you ask open-ended questions?
- Since formulating open-ended questions takes a bit of practice, let’s try turning a few *yes/no* or *either/or* questions into open-ended ones:
  - *Was it this object or that object that made the shadow?*
  - *Can you see your eyes, nose, and mouth when you look at your shadow, or the color of your hair or clothes?*
  - *If we want to make the shadow bigger, should we hold the flashlight closer or farther away?*





# Explore SHADOWS



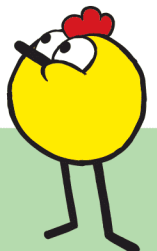
## Teaching Strategy: Encouraging Science Talk Among Children

### ***How does encouraging science talk among children benefit your teaching?***

When you select an activity that excites them, or have a discussion that piques their interest, you encourage children to participate more actively and to spontaneously talk about what they are doing and thinking.

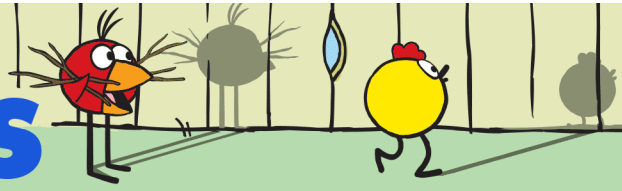
### ***Here are some ways to engage them:***

- **Find out what excites children.** Take the time to observe them. Notice their interests and incorporate these interests into your activities.  
**Example:** Begin your shadow explorations by going on a shadow hunt. Take note of children's questions and find out what they know about shadows. When you get back to the classroom, ask children to tell you something they want to learn about shadows or something they wonder about shadows. Use their questions and curiosities to begin planning your activities.
- **Personalize the learning by incorporating children's experiences** into the things you are doing.  
**Example:** You might have children bring in a favorite object that they can use to create shadows. You might also have children notice shadows at home. When they arrive in the morning you can ask, *What shadows did you see at home? Where did you see them? When did you see them?*
- **Promote science talk among children.** By encouraging children to discuss things together, you give them the chance to teach and guide one another. Through their collaborations, children often take the learning in new directions you might never have anticipated. You can even ask children to discuss and plan during their lunch and give them afternoon time to put their plans into action.  
**Example:** You can pair children up and present them with a problem that they have to solve together, such as, *How do you hide a shadow?*





# Explore SHADOWS



- **Introduce mystery.** Children always have a lot to talk about when there is a mystery involved. Mysteries engage children in science talk because they inspire children to wonder, make predictions, and to become detectives  
**Example:** Trace a shadow on a piece of paper. Lay out several objects and challenge children to find out which object was used to create the mystery shadow that you traced.

## Your Experiences

- Are there certain activities that seem to stimulate children's conversation? How do you get children curious, excited, and asking questions?
- What are ways you relate science explorations to children's own lives? How has personalizing the learning been effective?
- How do you encourage children to talk to each other about their science explorations? Have any challenges come up, and how have you handled them?
- Presenting children with a mystery is a great way to get them talking and wondering. What other approaches have worked for you?

## More Resources

### **For more information on science talk**

There are additional Teaching Strategy PDFs on the PEEP Web site along with instructional videos. These illustrate science talk related to the other PEEP science units: Colors, Water, Plants, Ramps, and Sound.

### **For more videos and information on other topics**

In addition, the Web site offers Teaching Strategies and videos on other professional development topics: Learning Environments, Individualized Instruction, and Documentation and Reflection.

