

CORE SKILL: THINK

Reasoning



What You Need to Know

Reasoning is the process of thinking through something to come to a conclusion. Preschoolers are increasingly able to understand cause and effect, draw conclusions, explain *why* they think something is happening, AND are able to test out those ideas to see if they are accurate. You can help children practice and develop their reasoning skills by prompting them to consider *why* things happen, *how* things work, and *what* will happen next. When they encounter things that they don't understand or can't explain, you can help them to make a hypothesis based on their prior experiences and test it out to see what they can learn.

Things to Consider

Inductive reasoning, or “bottom-up” reasoning, means children take specific instances and use them to make broader generalizations (e.g., “The stove at my home is hot and unsafe, so all stoves are hot and not safe to touch”). **Deductive reasoning**, or “top-down” reasoning, means taking a general idea or principle and moving it to a specific instance (e.g., “All living things need water. My plant is a living thing, so my plant must need water.”).

Young children use both inductive and deductive reasoning skills that result in errors in their thinking. For example, “My sister likes dolls, so *all* sisters like dolls” (inductive reasoning error) or if a song is always played at naptime, after some time, a child may believe it's time for a nap whenever that song is played (deductive reasoning error). In these instances, children are using good reasoning skills even though their conclusions are not completely correct.

Some children with disabilities may have difficulty using inductive reasoning and may be rigid in their deductive reasoning. For example, a child may not understand the meaning of a nonverbal cue without being explicitly taught. Similarly, a child may have difficulty cleaning up when told if the “clean-up” song is not sung. Talking through the logic process with children can help them to understand how these reasoning rules are great tools, but don't always work perfectly.

Development of Reasoning Skills

Between 36 and 48 months, children may:	Between 48 and 60 months, children may:
Make simple predictions with adult support and modeling.	Use background knowledge and experiences to make predictions.
Analyze and interpret data with adult support and assistance.	Be increasingly able to articulate the steps that need to be taken to conduct an investigation.
Draw conclusions and provide simple descriptions of results.	Analyze, interpret data, and draw conclusions with increasing independence.
	Compare results to initial prediction and generate new questions or designs with adult support.

Setting the Stage

Activities and materials that support the development of reasoning skills:

- ◆ **Books, pretend play, puppets:** prompt children to consider *how* the characters are thinking or acting and *why*. For additional support, use photos of the children to provide a concrete event/experience to connect their reasoning to.
- ◆ **Nature and/or science activities:** exploring, observing, predicting based on previous experiences/knowledge, conducting investigations or experiments to figure out how and why things work, and analyzing or talking through their results.
- ◆ **Problem-solving activities:** present children with materials and problems or challenges to solve. Prompt them to brainstorm, test out and analyze the effectiveness of their attempts. Some children may benefit from cause-and-effect toys to support their ability to build early inductive reasoning skills.
- ◆ **Matching or sorting games or routines:** match by attribute or function (e.g., clean up by trucks with trucks, cars with cars, balls with balls; sorting items by color, shape, or function).



Intentional Teaching Practices to Encourage Reasoning Skills

OBSERVE	OBSERVE Take time to observe children’s reasoning. Do they explore how to make things happen or how things work? Do they attempt to identify <i>why</i> something is happening? Are children able to use background information and previous experiences to inform their predictions? If they make predictions, are they able to compare the results to their predictions? Who could use some extra support to encourage them to seek information in a systematic way to explore why, what, and how the world works?
FOCUS	Narrate Reasoning Draw attention to <i>what</i> you’re doing and <i>why</i> , as well as the logic behind your actions. <ul style="list-style-type: none">◆ “I can’t fit this puzzle piece in this spot... Hmm, I wonder what will happen if I turn it this way. It worked!”◆ “I’m going to move these blocks to the hard floor so they are steady. The carpet was too soft, which made them fall over.”◆ “Our plants need water to survive, so we need to fill this watering can and give ours water.”◆ “I know you aren’t happy that we have to, but here’s why we have to...”
SCAFFOLD I	Ask Open-Ended Questions Ask open-ended questions (i.e., those that can’t be answered with only one or two words) that promote the use of reasoning. Be prepared to scaffold. Have children consider: <ul style="list-style-type: none">◆ Why and how something works: “How can we make it go higher?”, “Uh-oh, why do you think our tower fell?”, “What made our balloon rocket fly faster?”, “Why do you think they’re going faster than you on the slide?”◆ What will happen in the future (if...then): “If we don’t feed the fish, what will happen to it?” “What do you think will happen to this water if we pour it into this funnel instead of that one?”, “How can we solve the problem? If we... what will happen?” For nonverbal children or those with limited language, provide access to visuals to support their communication or offer choices of two reasons for children to consider.
SCAFFOLD II	Prompt Children’s Explanations Prompt children to explain their thinking and/or justify their answers. This will draw their attention to and give them practice explaining their reasoning. It will also provide you with insight that will help you provide targeted support (i.e., if you understand errors in their thought process, you know how to address). <ul style="list-style-type: none">◆ “How do you know that?”◆ “Why do you think that?”◆ “Why did you...?”◆ “Well, if we know that... then....”
KEEP IT GOING	Consider what you learned from observing children as well as their reaction to your Focus and Scaffolds. Find ways to build the activities from Setting the Stage into your regular routines.