

Questions That Nurture STEM Thinking

Productive Question	Effects of Question	Examples of Question Stems
<p>Attention Focusing</p>	<ul style="list-style-type: none"> ● Helps children focus on variables they are overlooking ● Helps to focus children's attention on significant details about objects and/or phenomena 	<ul style="list-style-type: none"> ● What do you notice? ● What is your friend doing with her ...? ● Which one is your friend using? ● What is happening when ...? ● Did you see what happened when ...? ● Have you seen ...?
<p>Measuring and Counting</p> <p>Early Mathematics</p>	<ul style="list-style-type: none"> ● Assists children in putting variables in relationship to each other ● Helps children become more precise about their observations 	<ul style="list-style-type: none"> ● How many did you ...? ● How far did ...? ● How fast did ...?
<p>Comparison</p> <p>Early Mathematics</p>	<ul style="list-style-type: none"> ● Assists children in noticing what is the same and what is different ● Helps children analyze and classify 	<ul style="list-style-type: none"> ● What is different when you ...? ● What is the same when you ...? ● How is this different from that?
<p>Action</p>	<ul style="list-style-type: none"> ● Assists a child who seems stumped by giving the answer disguised as a question. Performing the action may help the child to focus on the relevant variables, but without taking away the child's agency. 	<ul style="list-style-type: none"> ● What happens when you ...?
<p>Problem-Posing</p> <p>Never have one right answer</p>	<ul style="list-style-type: none"> ● Challenges children to find a way to change a variable ● Helps children plan and implement solutions to problems 	<ul style="list-style-type: none"> ● Can you find a way to ...? ● Can you find something that ...? ● Can you figure out how to ...? ● How can you ...?

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Productive Question	Effects of Question	Examples of Question Stems
<p>Reasoning</p> <p>Making predictions and generalizations</p>	<ul style="list-style-type: none"> Asks children to predict (deductive), which can include guessing or nonverbally choosing one of two possible outcomes <p>-or-</p> <ul style="list-style-type: none"> Asks children to generalize from their experiences (inductive), which can be nonverbal as well as verbal 	<p>Predict (deductive)</p> <ul style="list-style-type: none"> What do you think will happen if you ...? What will ...? What would happen if ...? <p>Generalize (inductive)</p> <ul style="list-style-type: none"> What have you learned about ...? Show me how you ... What can you tell me about ...? What do you now know about ...? What do you now know about what happens when ...?
<p>Reasoning</p> <p>Causal, only for those children who have demonstrated that they can reason causally</p>	<ul style="list-style-type: none"> Helps children think about experiences and construct ideas that make sense to them 	<ul style="list-style-type: none"> I wonder why ...? Do you think ...? What is your reason for ...? What makes ...?