

# MATHEMATICS TEACHING PRACTICE 5:

## *Pose purposeful questions*

Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.

Strategy and Process for Students with Disabilities	Digital Learning Experience
<p>Preparing for responses to be a question or modeling thinking about a question</p> <ul style="list-style-type: none"> <li>• During planning, work the task and anticipate where questions might be needed to assess or advance thinking.</li> <li>• Select potential questions to have ready.</li> <li>• Use cheat sheets or anchor charts to organize questions and keep them available during teaching and learning.</li> <li>• Pose questions "just in time" as determined by purpose, student need or learning intentions/success criteria.</li> <li>• Challenge students to ask questions to one another while thinking through a task; provide cheat sheets or discussion starters to support effective questioning skills.</li> </ul> <p>Standards for Mathematical Practice (SMPs): Look-Fors and Question Stems provides more information.</p>	<p>Considerations for the digital learning experience</p> <ul style="list-style-type: none"> <li>• Place questions in the chat box "just in time."</li> <li>• Ask students to respond to questions so others can see their responses using digital tools.</li> </ul>
<p>Scaffolding questions</p> <ul style="list-style-type: none"> <li>• Anticipate where students might get stuck.</li> <li>• Prepare questions to ask students if they get stuck.</li> <li>• Consider question cards to give students as a non-verbal strategy.</li> <li>• Differentiate the questions you present to students based upon individual needs.</li> </ul> <p>Sample questions:</p> <ul style="list-style-type: none"> <li>• Does this remind you of a problem you have solved before?</li> <li>• What resources are in your toolkit that might be useful?</li> </ul>	<p>Considerations for the digital learning experience</p> <ul style="list-style-type: none"> <li>• Place questions in the chat box "just in time" to scaffold students who are stuck.</li> <li>• Have a "help" link in your electronic assignment for students to click when needed. The link can take them to one or more scaffolded questions customized for that lesson.</li> </ul>
<p>Using metacognitive questioning</p> <ul style="list-style-type: none"> <li>• Model using metacognitive questions during think-alouds.</li> <li>• Give students access to these questions to help them develop the habit of thinking about their thinking.</li> </ul> <p>Metacognitive questions:</p> <ul style="list-style-type: none"> <li>• What is the problem asking?</li> <li>• How might I get started?</li> <li>• Does this remind me of a problem I have experienced before?</li> <li>• How might I prove my answer is correct?</li> </ul>	<p>For digital learning experiences, consider encouraging students to ask metacognitive questions by having a digital "Think About Your Thinking" button on a website or within a virtual platform that reminds them to ask themselves the metacognitive questions.</p> <p>Another way to support students in learning how to use metacognitive questions is to create a video modeling a similar problem and asking metacognitive questions during the think-aloud.</p>

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| <ul style="list-style-type: none"><li>• How might I represent my thinking so that it is visible to others?</li><li>• Why is this information important to the problem?</li></ul> |  |
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Contact your special education regional cooperative for more information on using virtual tools and additional resources.

## Reflection Questions

1. Have I reflected on common preconceptions, misconceptions and challenges or confusions that might arise for my students with disabilities, reflecting specifically on how I can address those through my instruction?
2. How can I support students with disabilities in working through problems by asking purposeful questions without taking the thinking away from them?
3. Am I asking students "How?" and "Why?" questions, and not simply procedural "What?" questions?
4. Have I planned for scaffolded questions to support students with disabilities in moving closer to the learning goal?
5. How can I use questions to guide my students with disabilities as they engage with problems that have complex, competing or multiple answers?
6. What opportunities for student reflection are embedded within my plan for instruction?

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