Mathematics Observation Tool

five equity-based practices in mathematics classrooms

	a representative lesson	a non-representative lesson	assessment considerations	questions for reflection
① **Going deep with mathematics**	A) Supports students in analyzing comparing, justifying and proving their solutions. B) Engages students in frequent debates. C) Presents tasks that have high cognitive demand and include multiple solution strategies and representations.	Promotes memorization without examination. Encourages students to follow procedures step by step. Presents tasks that have low cognitive demand and emphasize one solution strategy.	A task - Requires demonstration of multiple strategies or representations; Involves analysis and justification. Communication - Offers meaningful feedback that draws students' attention to "making sense" of the mathematics; Focuses on moving students' thinking forward.	How does my lesson promote mathematical analysis? How do I support students in closely examining the math concept?

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② **Leveraging multiple mathematical competencies**	A) Structures student collaboration to use varying math knowledge and skills to solve complex problems. B) Presents tasks that offer multiple entry points, allowing students with varying skills, knowledge, and levels of confidence to engage with the problem and make valuable contributions.	Promotes individual progress at specific, predetermined levels of ability. Often structures group work by ability. Presents tasks that are rigid and highly sequenced. Requires students to show	Assessing a task - Calls for a diversified rubric and an answer key that includes math practices such as examining patterns, generalizing, abstracting, making comparisons, and specifying conditions; Requires looking for multiple ways that	How do I identify and support mathematical contributions from students with different strengths and levels of confidence?

		mastery of skills prior to engaging in more complex problem solving.	students demonstrate their knowledge, such as through the use of language, gestures, pictures, physical models, and concrete objects.	
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③ **Affirming mathematics learners' identities**	A) Is structured to promote student persistence and reasoning during problem solving. B) Encourages students to see themselves as confident problem solvers who can make valuable mathematical contributions. C) Assumes that mistakes and incorrect answers are sources of learning. D) Explicitly validates students' knowledge and experiences as math learners. E) Recognizes mathematical identities as multifaceted, with contributions of various kinds illustrating competence.	Is structured to emphasize speed and competition. Connects mathematical identity solely with correct answers and quickness. Explicitly discourages mistakes and immediately corrects them, often without constructive feedback. Gives ambivalent value to flexibility, reasoning and persistence.	Communication - Focuses feedback on making sense of the mathematical idea rather than on the ratio of correct answers to the total possible; Focuses on strengths and improvements needed; Points out what is productive or problematic about a student's chosen strategy.	How do I structure my interactions with students to promote persistence with complex math problems? How do I discourage my students from linking speed with math "smartness"?
	a representative lesson	a non-representative lesson	assessment considerations	questions for reflection
	A) Centers student	Disconnects student	A task-	How do I

④ **Challenging spaces of marginality**	authentic experiences and knowledge as legitimate intellectual spaces for investigation of mathematical ideas. B) Positions students as sources of expertise for solving complex mathematical problems and generating math-based questions to probe a specific issue or situation. C) Distributes mathematics authority and presents it as interconnected among students, teacher, and text. D) Encourages student-to-student interaction and broad-based participation.	experiences and knowledge from the mathematics lesson or presupposes that students' knowledge and experiences are inconsequential to learning rigorous mathematics. Ascribes mathematics authority to the teacher or the text. Relegates complex problem solving to the end of lessons or reserves it for "more advanced" students. Segregates specific students (for example, those viewed as "low ability" or labeled as "English language learners") from the main activities. Restricts student "voice" to a few (often privileged) students.	Emphasizes public discussion of mathematical ideas (whole-class, small-group, pair-share); Requires reasoning behind correct and incorrect solutions.	connect my students' knowledge (in school and outside school) with the main math concept of this lesson? How do I structure a task to maximize student-generated math questions? How do I make sure that all students have opportunities to demonstrate their mathematics knowledge during lesson?
	a representative lesson	**a non-representative lesson**	**assessment considerations**	**questions for reflection**
⑤ **Drawing on multiple resources of knowledge (math, culture, language, family, community)**	A) Makes intentional connections to multiple knowledge resources to support mathematics learning. B) Uses previous mathematics knowledge as a bridge to promote new mathematics understanding.	Treats previous math knowledge as irrelevant or problematic (assuming, for example "They don't know any math"). Builds on negative stereotypes of the culture, community, or family, preventing math lessons that connect with authentic knowledge and experiences of students. (Such negative stereotypes include notions	A task involves the creation of stories or situations to solve or represent the problem. Communication offers connections to mathematical ideas that students may know but did not use in their solution or explanation.	How do I make connections with students' previous math knowledge? How do I get to know my students' backgrounds and experiences to support math learning in my classroom?

	C) Taps mathematics knowledge and experiences related to students' culture, community, family, and history as resources. D) Recognizes and strengthens multiple language forms, including connections between math and everyday language. E) Affirms and supports multilingualism.	like "Many parents are laborers— they can't help their children with math," "Asian families support mathematics--that's why Asian students are so good and so quiet", and "That is not how we do division in the United States".") Discourages mathematics discourse because it is deemed too difficult for students who have not mastered standard English. Supports English as the only language spoken in the classroom.		How do I affirm some of my students' multilingual abilities to help them learn math? What impact have race and racism had on my mathematics lessons? How can I learn from family and community members to support my students' mathematical confidence and learning? How can I effectively communicate with families the strengths and needs of students to affirm their math identities and promote math learning?

The Impact of Identity in K-8 Mathematics: Rethinking Equity-Based Practices (*Julia Aguirre, Karen Mayfield-Ingram, Danny Martin*)