

Protocol for the Observation of Instructional Practices

Standards of Mathematical Practices

Make sense of problems and persevere in solving them.			
The teacher encourages students to make sense of mathematics by engaging them in meaningful problems that embody concepts and skills.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher ensures that mathematical relationships among facts, ideas, and procedures are made explicit.	Notes
	3 Practitioner	The teacher engages students in meaningful problems by framing tasks in ways that are clear and explicit. Then, the teacher repeatedly checks in with students to help them clarify their cognitive process. The teacher decides when to provide clarifications or when to let students grapple on their own.	
	2 Apprentice	The teacher provides too much or too little direction for students to actively engage in making sense of the problem.	
	1 Novice	The teacher focuses solely on skills rather than meaningful problems that embody concepts and skills.	
The teacher provides time to help students persevere in finding appropriate strategies to solve problems.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher extends the discussion to include self-regulated learning strategies.	Notes
	3 Practitioner	The teacher provides ample time and encourages students to persevere by asking questions that provide meta-cognitive scaffolding to help them monitor and refine their problem-solving strategies.	
	2 Apprentice	The teacher monitors students' progress but does not allow adequate time for them to refine their problem-solving strategies.	
	1 Novice	The teacher does not take the time to monitor students' progress on the task.	
Reason abstractly and quantitatively.			
The teacher encourages students to make sense of relationships by abstracting a situation, representing and manipulating it symbolically (which is known as decontextualizing).	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher sequences questions that prompt students to articulate connections between various symbolic representations.	Notes
	3 Practitioner	The teacher engages students in abstracting the situation in context by providing structure that allows students to represent and manipulate the situation symbolically. The teacher also addresses misconceptions as students work to decontextualize the problem situation.	
	2 Apprentice	The teacher takes over students' thinking by modeling the situation, explaining the representation, and manipulating it symbolically for them	
	1 Novice	The teacher explains the problem situation symbolically and directs students to use the teacher-outlined procedure.	
The teacher encourages students to make sense of quantitative relationships by probing into the	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher requires students' articulation of the contextual meaning and elicits the referents for the symbols in an intentional and public way	Notes

Protocol for the Observation of Instructional Practices

referents for the symbols (which is known as contextualizing).	3 Practitioner	The teacher encourages students' flexible use of properties and operations to connect the symbolic representation to a meaningful context. The teacher asks questions that focus students' attention on deriving meaning from the numbers and operations in the problem situation	
	2 Apprentice	The teacher shows and explains the derived meaning from the number and operations in the problem situation.	
	1 Novice	The teacher does not connect the symbolic representation to the context of the problem situation	
Construct viable arguments and critique the reasoning of others.			
The teacher encourages students to construct viable arguments by engaging them in problems that employ mathematical concepts and ideas that can be explored and analyzed.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher requires students to formally articulate and justify the validity of their own mathematical arguments and attends to the logical progression of the statements therein	Notes
	3 Practitioner	The teacher asks students to explain and evaluate their own mathematical arguments and encourages them to clarify assumptions and conjectures. The teacher attends to how students' statements are related to each other.	
	2 Apprentice	The teacher asks students to present but not evaluate their own mathematical arguments. The teacher determines the validity of the students' arguments.	
	1 Novice	There is a missed opportunity for the teacher to allow students to make conjectures or present mathematical arguments.	
The teacher encourages students to critique the reasoning of others by engaging them in active discourse related to the problem and the solution.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher focuses students' attention on the comparison of methods and solutions for effectiveness and efficiency.	Notes
	3 Practitioner	The teacher encourages the development of a classroom culture that focuses on mathematical argument by asking students to share and defend strategies and solutions.	
	2 Apprentice	The teacher asks students to share strategies and solutions, but students become confused and this becomes the central issue for the class.	
	1 Novice	There is a missed opportunity for the teacher to allow students to critique the reasoning of others.	
Model with mathematics.			
The teacher engages students in mathematical modeling.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher routinely has students reflect on their models and compare them to other models to determine the advantages and disadvantages of each.	Notes
	3 Practitioner	The teacher engages students in solving realistic problems and encourages them to organize, record, and communicate mathematical relationships while all the time explicitly relating the mathematics	

Protocol for the Observation of Instructional Practices

		back to the situation that it models	
	2 Apprentice	The engagement links the mathematics to the situation it models, but the discussion is more about the mechanics and less about the mathematics	
	1 Novice	The teacher focuses only on the mathematics and does not relate it to the situation it models.	
The teacher facilitates a discussion in evaluating the appropriateness of a mathematical model.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher requires students to evaluate the appropriateness of the mathematical model and discusses implications of transferring what they	Notes
	3 Practitioner	The teacher facilitates a discussion in evaluating the appropriateness of a mathematical model.	
	2 Apprentice	The teacher explains the appropriateness of a mathematical model.	
	1 Novice	There is a missed opportunity to discuss the appropriateness of a mathematical model.	
Use appropriate tools strategically.			
The teacher helps students learn to select available tools including technology and other resources that make the most sense for the task at hand.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher expects students to discuss the potential misuse or ineffective use of every tool made available. The expert teacher also expects students to creatively find appropriate alternatives where tools are not available.	Notes
	3 Practitioner	The teacher provides and models the selection of appropriate tools including technology and other mathematical resources. The teacher makes clear why their use is an important consideration for the task at hand.	
	2 Apprentice	The teacher takes over students' selection of tools by designating the tools and demonstrating their use.	
	1 Novice	The teacher does not incorporate an appropriate and necessary tool for the task.	
Attend to precision.			
The teacher helps students learn to reason and communicate mathematically using precise terms, definitions, and symbols.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher requires students to formulate, compare and reason from definitions.	Notes
	3 Practitioner	The teacher helps students learn to reason and communicate mathematically by modeling and requiring the use of precise terms, definitions, and symbols.	
	2 Apprentice	The teacher communicates mathematically using precise terms, definitions, and symbols and identifies students' imprecision but does not require them to revise their communication with precision.	
	1 Novice	The teacher does not use precise terms, definitions, and symbols and inconsistently intervenes when students use them imprecisely.	

Protocol for the Observation of Instructional Practices

The teacher requires attention to accuracy, efficiency, and precision of methods and solutions.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher pushes students to ask questions that validate accuracy, efficiency, and precision of methods and solutions.	Notes
	3 Practitioner	The teacher consistently asks questions to validate accuracy, efficiency, and precision of methods and solutions.	
	2 Apprentice	The teacher attends to accuracy, but does not ask questions to validate efficiency of students' methods or precision appropriate for the problem's context.	
	1 Novice	The teacher does not attend to accuracy, efficiency of students' methods, or precision appropriate for the problem's context.	
Look for and make use of structure.			
The teacher engages students in determining the use of a structure or a pattern.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher helps students learn to continuously evaluate structure not only for use but also for efficiency.	Notes
	3 Practitioner	The teacher engages students in mathematical analysis by prompting them to recognize a pattern or structure in order to identify an effective solution path. When the teacher helps students analyze properties, definitions, and contextual meanings, they are "using structure" to explain mathematics.	
	2 Apprentice	While the teacher attends to the structure by using it to develop the lesson, the teacher does not require students to identify the pattern or use it on their own.	
	1 Novice	The teacher requires students to apply the same algorithm to the task, although other structures may have surfaced during the lesson.	
Look for and express regularity in repeated reasoning.			
The teacher encourages students to focus on regularity to create generalizations.	4 Expert	In addition to exhibiting the behaviors of a practitioner, the expert teacher helps students move beyond extending patterns to recognizing the importance of understanding and expressing general methods or shortcuts.	Notes
	3 Practitioner	The teacher encourages students to focus on the regularity of repetition and to notice when something happens over and over again. The teacher encourages students to form a mathematical expression that captures the repeated reasoning.	
	2 Apprentice	The teacher creates the generalization for the students without regard to their recognition of the regularity and its use in generalizing the results.	
	1 Novice	There is a missed opportunity to illuminate repeated reasoning.	

Adapted from www.achievethecore.org