INSTRUCTION (Rigor with Scaffolding for Success): HELP

RICH MATHEMATICAL TASKS		
Scaffolding for Success:		
1 ☐ Uses and encourages precise and accurate mathematics, academic language, terminology and concrete or abstract representations (e.g. pictures, symbols, expressions, equations, graphics, models) in the discipline.	**2** ☐ Addresses instructional expectations and is easy to understand and use.	**3** ☐ Recommend and facilitate a mix of instructional approaches for a variety of learners such as using multiple representations (e.g. including models, using a range of questions, checking for understanding, flexible grouping, pair-share).
➢ Does this set of instructional materials clearly identify and work to develop key academic language and accurate and precise mathematics? **Note**: This criterion is repeated from the previous room to emphasize the importance of vocabulary.	➢ Does the unit include expectations for how the instruction should take place and whether the overall organization/format is easy to understand and use? ➢ Is the visual design supportive of easy use by teacher and student? **Note:** This criterion is about supporting effective unit design in this part of the unit planner.	➢ Is there a mix of instructional approaches, a gradual removal of supports, and an effective sequence for the learning activities of the lesson/unit? ➢ How are manipulatives (virtual or physical) faithful representations of the math objects they represent and when appropriate are connected to written methods? **Note**: Bottom line: How will students show understanding and misconceptions? How will they ask and produce answers and solutions, but also make arguments and explanations, diagrams, math models?
4 ☐ Gradually remove supports, requiring students to demonstrate their mathematical understanding independently.	**5** ☐ Demonstrate an effective sequence and a progression of learning where the concepts or skills advance and deepen over time.	**6** ☐ Expect, support and provide guidelines for procedural skill and fluency with core calculations and mathematical procedures (when called for in the standards for the grade) to be performed quickly and accurately.
➢ Is there a mix of instructional approaches, a gradual removal of supports, and an effective sequence for the activities of the lesson/unit? **Note**: This criterion supports pacing.	➢ Is there opportunity for student understanding to deepen over the course of the lesson/unit? ➢ How will the learning be intentionally sequential? ➢ How does the unit cross-reference the standards addressed and provide an estimate of instructional time for each lesson/unit? **Note**: This criterion is also about pacing.	➢ Does the lesson/unit emphasize and support an appropriate balance of procedural and conceptual understanding? **Note**: Remember it is about a balance of skill and fluency.

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☐ Includes clear and sufficient guidance to support teaching and learning of the targeted standards, including when appropriate, the use of technology and media.	☐ Engages students in productive struggle through relevant, thought-provoking questions, problems and tasks that stimulate interest and elicit mathematical thinking.
➢ If appropriate, are technology and/or media applied in the lesson/unit? ○ Technology can assist in visualizing and understanding important math concepts and support students' mathematical reasoning and problem solving. ○ Technology can assist students in investigating mathematical ideas and problems that might otherwise be too difficult or time-consuming to explore. ○ Technology can provide virtual manipulatives. ○ Students learning about the usefulness of a range of tech tools in particular contexts. ○ On-line instructional videos judiciously used to support, not replace effective instruction. ➢ Does the lesson/unit provide clear directions and guidance so that even an inexperienced teacher can successfully guide students to an understanding of the targeted standards? ➢ Are materials easily customized for individual learners: a) Digital materials include opportunities for teachers to personalize learning for all students, using adaptive or other technology innovations. b) materials can be easily customized for local use. For example, materials may provide a range of lessons to draw from on a topic. ➢ Are clear directions for creating opportunities for students and teachers to collaborate with each other (websites, discussion groups, webinars) provided? **Note**: This criterion is about technology enhancing student learning.	➢ Do you see evidence that all students are given opportunities to engage in a productive struggle through thought-provoking questions with little scaffolding? ➢ How will students discuss and justify their strategies to one another? ➢ How does the unit provide teachers with guidance on developing students' questioning? ➢ How do the tasks promote reasoning and problem solving? **Note**: This criterion is primarily about regular opportunity. Note that this criterion asks reviewers to look for evidence that all students are given opportunities to engage with problems and tasks that require them to struggle productively in their solution. This criterion does not require evidence of scaffolds specific to special learning or language needs. Rather, this criterion asks for evidence that all students are expected to and given opportunity to do challenging mathematical work. In NCTM's Principles to Action, p. 63, it is stated, "*Mathematics ability is a function of opportunity, experience, and effort-not of innate intelligence. Mathematics teaching and learning cultivate mathematics abilities. All students are capable of participating and achieving in mathematics, and all deserve support to achieve at the highest levels*."

Instructional Shift Intentionally Considered:

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RIGOR: Requires students to engage with and demonstrate challenging mathematics with appropriate balance among the following:

☐ **Procedural Skill and Fluency:** Expects, supports and provides guidelines for procedural skill and fluency with core calculations and mathematical procedures (when called for in the standards for the grade) to be performed quickly and accurately.

☐ **Application:** Provides opportunities for students to independently apply mathematical concepts in real-world situations and solve challenging problems with persistence, choosing and applying an appropriate model or strategy to new situations.

☐ **Conceptual Understanding:** Develops students' conceptual understanding through tasks, brief problems, questions, multiple representations and opportunities for students to write and speak about their understanding.

➢ The three aspects of rigor are concepts, procedures/fluency and application. Does the lesson or unit intentionally emphasize some aspect(s) more than others? (For example, the lesson or unit might emphasize conceptual understanding but not application or procedure.)

➢ Given the goals of the lesson or unit, is the emphasis appropriate and logical? (A lesson involving only a single aspect of rigor may be just right, provided the single aspect of rigor that is present is handled well in the lesson.)

- For a unit or longer lesson: How do the instructional materials intentionally present a balance of application, conceptual understanding, and procedural skill and fluency? **Note**: the three aspects of rigor are not always treated separately. The three aspects are balanced with respect to the standards being addressed.

Note: While the rigor shift is crucial to this criteria, the curriculum developer cannot forget to apply the focus and coherence shifts when sequencing learning in the unit.

Instructional Strategies, Rich Math Tasks, and Exercises - **Bottom line**: How will the unit activate (activating) learning versus providing activities (activitating)? - How will the unit use teaching strategies as "learning" strategies? - How does the underlying design of the materials distinguish between tasks and problems/exercises? In essence, the difference is that in solving tasks, students learn new mathematics, whereas in working problems/exercises, students apply what they have already learned to build mastery. Each task or problem/exercise has an intentional purpose that supports the progression of learning in the unit.	**Standards** **(Targeted Content and Practices)**
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