

Real World Application

Productive Practices / Beliefs / Actions (What it IS)	Unproductive Practices / Beliefs / Actions (What it is NOT)
<p>A balance of grouping for students - whole group / small group / individual</p> <ul style="list-style-type: none"> Groups need to be based on a variety of factors: homogeneous/heterogeneous, long & short-term groupings, collaboration. Teachers choose grouping structures based on the tasks being worked on. 	<p>Teachers lead discussions</p> <ul style="list-style-type: none"> “The one doing the talking is the one doing the learning.” Let’s let the students do the learning! This practice robs students of opportunities to collaborate and engage in productive mathematical discourse.
<p>Mathematical discourse with engagement</p> <ul style="list-style-type: none"> Teachers and students develop mutual respect, utilize strategies to build a safe and supportive culture while constructing viable arguments and critiquing the reasoning of others in a courteous manner Teachers assume facilitator role to pose questions in a strategic way that meets students needs, honors students current level of thinking, and progresses their thinking in the search for understanding and skill Students share in the responsibility of listening, questioning, constructing, and critiquing 	<p>Silent classrooms with compliance</p> <ul style="list-style-type: none"> Teacher delivers instruction to students, with minimal regard for students’ prior knowledge Students listen and reply directly to the teacher when requested, with little to no peer interaction
<p>Teachers facilitate the discussion, allowing conversations off “planned” path and intervene only as needed</p> <ul style="list-style-type: none"> Teachers assume facilitator role to pose questions in a strategic way that meets students needs, honors students current level of thinking, and progresses their thinking in the search for understanding and skill Teachers allow students to take the discussion in a new direction in solving the problem. 	<p>Teacher asks few questions, often answering them himself/herself</p> <ul style="list-style-type: none"> Teacher directs instruction, only asking questions to a few students that are engaged. Teacher directs questions to one or two students, leaving the rest of the students to only listen. Teacher asks and answers their own questions.

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<p>Primary focus is rich mathematical tasks or projects that promote understanding and relevance</p> <ul style="list-style-type: none"> ● Students reason qualitatively and quantitatively. ● Students persevere while creatively and critically solving problems. ● Students make multiple connections ● Students embrace challenges as learning opportunities. ● Teacher implements tasks that promote conceptual understanding prior to teaching procedures 	<p>Primary focus is computation problems and practice</p> <ul style="list-style-type: none"> ● Teacher assigns a set of procedural problems without context. ● Students perform rote procedures without understanding.
<p>Community partners to make connections to mathematical concepts</p> <ul style="list-style-type: none"> ● Community members, parents, other adults are brought in to share their experiences with this type of real-world problem to help students see the relevance in their learning ● Teachers become more aware of the mathematical needs in the current real-world reality 	<p>Isolated algorithms and formulas with no connections</p> <ul style="list-style-type: none"> ● Students see not relevance to their learning ● The question “When are we ever going to use this?” can only be answered with “In the next math course you are taking”
<p>Teachers pose questions that promote productive struggle for learning</p> <ul style="list-style-type: none"> ● Teacher and students recognize struggle as part of meaningful learning experiences ● Teacher and students view struggle as valuable learning opportunities ● Teacher provides scaffolding needed to prevent student frustration while still allowing the student to grapple with the math concept. 	<p>Teachers assign students easy problems that they will get right</p> <ul style="list-style-type: none"> ● Teacher provides no scaffolding. ● Teacher lowers the demand of the task to alleviate frustration. ● Teacher shows how to work the problem step by step.

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<p>Assessment encourage students to reason about the units or rounding that makes sense for the situation</p> <ul style="list-style-type: none"> • Problem situations on assessments allows students to determine the reasonableness of their answers. • Students are allowed the flexibility to use the units and estimation strategies they deem most appropriate for the problem situation. 	<p>Assessment directions specify units or rounding directions</p> <ul style="list-style-type: none"> • Detailed instructions are provided for students to eliminate any deviation from the intended answer. • Students are provided “one way” to solve the problem situation in order to reach the “right answer.”
<p>Honor and learn from mistakes</p> <ul style="list-style-type: none"> • Teacher intentionally acknowledges mistakes using responsive teaching • Students are encouraged to analyze their mistakes and learn from them 	<p>Rewarding “correct” answers</p> <ul style="list-style-type: none"> • Teacher only looks for the right answer • When a wrong answer is shared, it is dismissed and the search for the correct answer continues
<p>Tasks chosen based on state standards, student interest and relevance</p> <ul style="list-style-type: none"> • Planning of real-world problem situations / tasks starts with the math standard, then the problem is chosen 	<p>Tasks based on great project idea without regard to the standards</p> <ul style="list-style-type: none"> • A project idea comes to mind and the teacher tries to find a standard that would fit the project