

## RSD 17 MATHEMATICS INSTRUCTION TOOL

The purpose of this document is to articulate the intentional and high leverage actions involved in impactful instructional design and delivery. Teachers can consider this tool as they reflect upon their instructional design and delivery. While not intended to be a checklist, or for each element to exist in every lesson, this document can guide decision making around planning and instruction in our classrooms.

General Practices	
<b>High Expectations</b>	
<b>Teacher:</b> <ul style="list-style-type: none"> <li>• Holds all students to high academic expectations, encourages intellectual risk-taking through the facilitation of dialogue or other methods, and creates the conditions for a positive climate conducive for learning.</li> </ul>	<b>Students:</b> <ul style="list-style-type: none"> <li>• Are cognitively engaged and feel welcomed to participate.</li> <li>• Pose questions of their own and respond to questions posed by the teacher or by fellow students.</li> </ul>
<b>Learning Target(s): Clear and Known</b>	
<b>Teacher:</b> <ul style="list-style-type: none"> <li>• Communicates rigorous, measurable, curriculum-based lesson target(s); the target(s) clearly drive the instruction.</li> <li>• Frames the learning so that students know: what they need to know and be able to do; what activities they will be involved with that are in direct support of the learning target, and; how their learning will be assessed.</li> <li>• Connects students' current knowledge with prior learning.</li> </ul>	<b>Students:</b> <ul style="list-style-type: none"> <li>• Are aware of and focused upon the learning target (what they should know and be able to do).</li> <li>• Take responsibility for making sense of tasks by drawing on and making connections with prior understanding and ideas.</li> </ul>
<b>Instructional Grouping</b>	
<b>Teacher:</b> <ul style="list-style-type: none"> <li>• Intentionally decides upon whole class, small group and/or individual structures based on the learning target and knowledge of students' skills in relation to the target.</li> <li>• Purposefully and flexibly groups students in interdependent partnerships/small groups where each person contributes to the learning of the group.</li> </ul>	<b>Students:</b> <ul style="list-style-type: none"> <li>• Are engaged in critical thinking whether working as a whole class, in groups, or as individuals.</li> <li>• Provide support to each other with cues and questioning to generate ideas or solutions (not simply to give each other the right answers).</li> </ul>
<b>Communication/Discourse</b>	
<b>Teacher:</b> <ul style="list-style-type: none"> <li>• Facilitates discourse so that students explain their own thinking and understand the approaches of others.</li> <li>• Uses tasks that encourage students to analyze situations, draw conclusions, justify, defend/refute and communicate examples and counterexamples.</li> <li>• Poses probing questions to clarify and/or improve students' arguments.</li> <li>• Demonstrates and expects precision through correct usage of academic vocabulary.</li> </ul>	<b>Students:</b> <ul style="list-style-type: none"> <li>• Construct arguments using drawings, diagrams, models, equations or other representations in order to present and defend conclusions/answers.</li> <li>• Listen carefully to and critique the reasoning of peers, using examples to support or counterexamples to refute arguments, orally and/or in writing</li> <li>• Use academic vocabulary appropriately orally and in writing. (precision)</li> </ul>
<b>Checking for Understanding and Providing Feedback</b>	
<b>Teacher:</b> <ul style="list-style-type: none"> <li>• Provides students with formative guidance as to how they are doing on a particular task with specific suggestions for improvement.</li> <li>• Checks for understanding throughout the lesson, using informal and formal methods, and adjusts/ differentiates accordingly.</li> <li>• Provides small group and/or individualized support as needed and appropriate.</li> <li>• Anticipates and identifies student misconceptions to (re)direct learning toward the target.</li> <li>• Uses a system to note students' progress toward the learning target(s) gathered from conferences and student work products and looks across these notes to develop next steps for instruction.</li> </ul>	<b>Students:</b> <ul style="list-style-type: none"> <li>• Are able to show what they know through a variety of ongoing formative and summative assessments.</li> <li>• Make meaning and apply strategies when/if understanding breaks down (utilize independent strategies and peers and before seeking adult support).</li> </ul>

Problem Solving	
<p><b>Teacher:</b></p> <ul style="list-style-type: none"> <li>• Presents open-ended and/or non-routine problems with no one obvious solution pathway.</li> <li>• Creates opportunities for students to explain their thinking.</li> <li>• Provides opportunities for students to connect concepts to “their” world.</li> <li>• Encourages students to check their answers using multiple strategies.</li> </ul>	<p><b>Students:</b></p> <ul style="list-style-type: none"> <li>• Are actively engaged in solving problems; thinking is visible.</li> <li>• Look for and make use of patterns and/or relationships to solve problems</li> <li>• Persevere with a task/problem until it is completed to the stated expectation of performance.</li> <li>• Describe and justify their understanding and reasoning with drawings, diagrams, models, equations or other representations</li> <li>• Apply what they are learning to everyday life.</li> <li>• Check answers; continually ask self, “Does this make sense?” (Uses error analysis)</li> </ul>
Precision	
<p><b>Teacher:</b></p> <ul style="list-style-type: none"> <li>• Demonstrates and expects precision with numbers, symbols and units.</li> <li>• Demonstrates and expects precision through correct usage of academic vocabulary.</li> </ul>	<p><b>Students:</b></p> <ul style="list-style-type: none"> <li>• Use, understand and state the meanings of symbols.</li> <li>• Express numerical answers with precision, including units</li> <li>• Use academic vocabulary appropriately, orally and in writing.</li> </ul>
Use Appropriate Tools	
<p><b>Teacher:</b></p> <ul style="list-style-type: none"> <li>• Provides a variety of tools and technology for students to explore and deepen their understanding of concepts.</li> <li>• Provides problem solving tasks that require students to consider a variety of tools for solving. (Tools might include pencil/paper, manipulatives, concrete models, ruler, protractor, calculator, spreadsheet, computer algebra system, statistical package, or dynamic geometry software, etc.)</li> </ul>	<p><b>Students:</b></p> <ul style="list-style-type: none"> <li>• Are familiar with a variety of tools and use them appropriately when solving problems.</li> </ul>