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| **Mathematics Teaching Practices** |
| **Establish mathematics goals to focus learning**. Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions. |
| **Implement tasks that promote reasoning a problem solving**. Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies. |
| **Use and connect mathematical representations**. Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving. |
| **Facilitate meaningful mathematical discourse.** Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments. |
| **Pose purposeful questions.** Effective teaching of mathematics uses purposeful questions to assess and advance students’ reasoning and sense making about important mathematical ideas and relationships. |
| **Build procedural fluency from conceptual understandings.** Effective teaching of mathematics build fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems. |
| **Support productive struggle in learning mathematics**. Effective teaching of mathematics consistently provides students, to engage in productive struggle as they grapple with mathematical ideas and relationships. |
| **Elicit and use of evidence of student thinking**. Effective teaching of mathematics uses evidence of student thinking to assess toward mathematical understanding and to adjust instruction continually in ways that support and extend learning. |

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| **Beliefs about teaching and learning mathematics** | |
| ***Unproductive Beliefs*** | ***Productive Beliefs*** |
| Mathematics learning should focus on practicing procedures and memorizing basic number combinations. | Mathematics learning should focus on developing understanding of concepts and procedures through problem solving, reasoning, and discourse. |
| Students need only to learn and use the same standard computational algorithms and the same prescribed methods to solve algebraic problems. | All students need to have a range of strategies and approaches from which to choose in solving problems, including, but not limited to, general methods, standard algorithms, and procedures. |
| Students can learn to apply mathematics only after they have mastered basic skills. | Students can learn mathematics through exploring and solving contextual and mathematical problems. |
| The role of a teacher is to tell students exactly what definitions, formulas, and rules they should know and demonstrate how to use this information to solve mathematics problems. | The role of a teacher is to engage students in tasks that promote reasoning and problem solving and facilitate discourse that moves students toward shared understanding of mathematics. |
| The role of the student is to memorize information that is presented and then use it to solve routine problems on homework, quizzes, and tests. | The role of the student is to be actively involved in making sense of mathematical tasks by using varied strategies and representations, justifying solutions, making connections to prior knowledge or familiar contexts and experiences and considering the reasoning of others. |
| An effective teacher makes the mathematics easy for students by guiding them step by step through problem solving to ensure that they are not frustrated or confused. | An effective teacher provides students with appropriate challenge, encourages perseverance in solving problems, and supports productive struggle in learning mathematics. |