# Productive vs. Unproductive Card Sort

Rationale for this activity: "Teachers' beliefs influence the decisions that they make about the manner in which they teach mathematics… Students' beliefs influence their perception of what it means to learn mathematics and their dispositions toward the subject." (NCTM, 2014)

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NOTE TO FACILITATOR: Cut apart the cards below and mix them up before the meeting.

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| **Quote**<br>~3min | Share Quote<br>• "Teachers' beliefs influence the decisions that they make about the manner in which they teach mathematics… Students' beliefs influence their perception of what it means to learn mathematics and their dispositions toward the subject." (NCTM, 2014) |
| **Brainstorm**<br>~12min | Share<br>• The 3 Realms Venn Diagram (see last page)<br>• Explain: Many teachers live in one or two of these three realms but in order for real change to take place in the classroom all three areas need to be considered. You can enter a problem from any angle but without looking through the other angles as well reform cannot occur.<br>• On a 3x5 card, brainstorm productive and unproductive beliefs teachers have about mathematics. |
| **Group Discussion & Card Sort**<br>~15min | Group Discussion<br>• Hand a set of cards to each group (2-4 per group) and have them discuss the belief and whether it is Productive or Unproductive including any personal experiences that come to mind with that quote.<br>Group Card Sort<br>• Have each group sort the cards according to whether they think it is Productive or Unproductive. |
| **Summarize**<br>~15 min | Look at the table on page 11 of Principles to Action to check your sort.<br>• Think of one or two of these beliefs as if it were on a continuum. Discuss with a partner where you are at on this continuum and discuss ways to commit to growing in this area. If you are working with a teammate/or in a PLC, you might consider identifying one to work on together. |

Ideas modified from Principles to Actions, Protocol written by Amanda Baumgartner at ESD 123

## Cards for sort

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| 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 after they have mastered the basic skills. | Students can learn mathematics through exploring and solving contextual and mathematical problems. |
| The role of the 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 the 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 solve routing problems on homework, quizzes, and tests. | The role of the student is to be actively involved in making sense of mathematics 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. |

# Productive and Unproductive Beliefs

- On a 3x5 card, individually brainstorm **Productive** and **Unproductive Beliefs** teachers have about mathematics.