Responsive Math Teaching: Instructional Model

Responsive Math Teaching Project

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Responsive Math Teaching: Instructional Model

Abstract
The Responsive Math Teaching (RMT) Instructional Model breaks high-quality math teaching down into seven core components:

1. Plan: Select or adapt an appropriate task, identify the mathematical goal(s), and anticipate possible solution paths and challenges.
2. Launch: Set up the task so that students understand the problem and can access the important mathematics.
3. Facilitate productive struggle: Support students to engage in authentic problem solving.
4. Make student thinking visible: Facilitate the sharing of student strategies and reasoning and engage students in making sense of each other’s thinking.
5. Connect to the mathematics: Guide students to make explicit connections between their strategies and solutions and the key mathematical ideas.
6. Build and expand: Facilitate application and/or practice that builds off and extends students’ current understanding.
7. Reflect: Engage students in connecting and consolidating their understanding of the mathematical ideas.

Keywords
education, teaching, math, teacher learning, professional development, math education, mathematics, instructional model, math classroom, instruction

Disciplines
Education
**Plan and Anticipate**
- Identify and unpack the mathematical goal
- Select or adapt a task that provides students with a problem to solve rather than a procedure to follow
- Anticipate multiple solution paths, accessibility of context, language challenges.

**Launch**

**Facilitate Struggle**
- Engage students in connecting and consolidating understanding of the mathematical ideas
  - Whole class debrief
  - Collaborative creation of a chart to anchor problem solving
  - Written reflection
  - Exit slip for formative assessment.

**Support Students to Engage in Productive Struggle**
- Develop individual and collective understanding of task, context, and language
- Elicit and build connections to prior knowledge and experience
- Set expectations for working, solution, justification, tools.

**Reflect and Consolidate**

**Build and Expand**

**Facilitate Sharing of Student Strategies/Reasoning Through Whole Class Discussion**
- Elicit multiple strategies and a diversity of voices
- Cultivate rich explanations (e.g., wait time; asking why and how; revoicing)
- Intentionally make space for and assign competence to marginalized and/or low-status student contributions
- Represent student thinking visually
- Engage students in making sense of each other’s thinking
- Strategically select and sequence strategies.

**Fixup the Task**
- Introduce standard language, notation, models
- Help students formalize ideas by generalizing patterns, theories or proving/disproving conjectures
- Connect procedures to concepts.

**Engage Students in Connecting and Consolidating Understanding of the Mathematical Ideas**
- Whole class debrief
- Collaborative creation of a chart to anchor problem solving
- Written reflection
- Exit slip for formative assessment.

**Guide Students to Make Explicit Connections Between Their Strategies and Solutions and the Key Mathematical Ideas**
- Introduce standard language, notation, models
- Help students formalize ideas by generalizing patterns, theories or proving/disproving conjectures
- Connect procedures to concepts.

**Facilitate Application and Practice that Builds Off Students’ Current Understanding**
- Pose a similar problem (vary context, structure, and/or number complexity)
- Provide differentiated support, instruction, and/or practice.
- Teach a mini-lesson on an identified need.

**Mathematical Goal**

**Connect to Mathematical Goal**

**Make Student Thinking Visible**

**Build and Expand**

**Connect to Mathematical Goal**

**Make Student Thinking Visible**

**Reflect and Consolidate**

**Learner**

**Community**

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**Set Up the Task**
- Develop individual and collective understanding of task, context, and language
- Elicit and build connections to prior knowledge and experience
- Set expectations for working, solution, justification, tools.