Design Question 4: Helping Students Generate and Test Hypotheses in the K-2 Classroom

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Learning Goals

• Teachers will develop a deeper understanding of what “DQ4: Helping Students Generate and Test Hypotheses” looks like in a K-2 classroom.

• Teachers will utilize a Question and Discussion Protocol to help students generate and test hypotheses.
11 Most Important Elements

- Element 1 – Providing Clear Learning Goals and Scales
- Element 6 – Identifying Critical Information
- Element 7 – Organizing Students to Interact with New Knowledge
- Element 11 – Elaborating on New Information
- Element 12 – Recording and Representing Knowledge
- Element 15 – Organizing Students to Practice and Deepen Knowledge
- Element 17 – Examining Similarities and Differences
- Element 18 – Examining Errors in Reasoning
- Element 20 – Revising Knowledge
- Element 21 – Organizing Students for Cognitively Complex Tasks
- Element 22 – Engaging Students in Cognitively Complex Tasks Involving Hypothesis Generation and Testing
Take Time to Think

• Choose one of the two elements in DQ4 and independently record what this might look like in a K-2 classroom
  – Element 21: Organizing Students for Cognitively Complex Tasks
  – Element 22: Engaging Students in Cognitively Complex Tasks Involving Hypothesis Generation and Testing
Talk on Topic/Listen Actively

- Turn and talk to a neighbor about what you wrote
Give Others a Chance; Invite Others to Respond to You

• Volunteers share some of their ideas with the group.
Use Clear Protocols

Clear protocols have explicit steps to assure the right outcomes. This protocol is one approach.

- Take time to think
- Talk on topic/listen actively
- Give others a chance; invite others to respond to you
- Build on what the person said
- Ask clarifying or extension questions
- Answer and discuss respectfully
K Lesson – Visualizing Number Combinations

• While watching the video, score the teacher on element 22 of Marzano’s learning map

• https://www.teachingchannel.org/videos/visualizing-number-combinations
**Scale for Engaging Students in Cognitively Complex Tasks Involving Hypothesis Generation and Testing**

<table>
<thead>
<tr>
<th>Innovating</th>
<th>Applying</th>
<th>Developing</th>
<th>Beginning</th>
<th>Not Using</th>
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<tbody>
<tr>
<td>Adapts and creates new strategies for unique student needs and situations in order for the desired effect to be evident in all students.</td>
<td>Engages students in cognitively complex tasks (e.g. decision making, problem solving, experimental inquiry, investigation) and monitors for evidence of the extent to which the majority of students are generating and testing hypotheses.</td>
<td>Engages students in cognitively complex tasks (e.g. decision making, problem solving, experimental inquiry, investigation), but the majority of students are not monitored for the desired effect of the strategy.</td>
<td>Uses strategy incorrectly or with parts missing.</td>
<td>Strategy was called for but not exhibited.</td>
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Build on What the Person Said/Ask Clarifying or Extension Questions

Turn and talk with a partner: What questions would you ask this teacher to help her move to the next level on Marzano’s rubric?
Marzano’s Recommendations for Classroom Practice

• Establishing Grounds to Support Valid Claims
• Providing Backing to Establish the Validity of Grounds
• Framing Qualifiers to Analyze Levels of Certainty and Exceptions for Claims
• Addressing the Limits of Statistical Information
What does THAT mean to a K-2 Student?

• My new idea is...
  “My new idea about hamsters is that they like to play together.”

• I think this is true because...
  “I think this is true because I saw them playing.”

• What I actually saw...
  “I saw them taking turns on the hamster wheel and sharing their food.”

• What would happen if...
  After students share their thoughts, the teacher provides a scenario that would challenge or change their new idea.
Application

Use the remainder of the time to work independently or with grade level colleagues to think of a lesson you will be teaching in September or October where you can incorporate elements 21 or 22.