GETTING TO THE HEART OF EQUITY

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Session Highlights

• Do some math together

• Analyze characteristics of instructional tasks

• Propose instructional practices that help students reframe their view of themselves as math learners
Equitable Access

Instructional Task

Rigorous Math

Multiple Avenues

Struggle

Open to Exploration
Equity and Access

Equitable access means

• high expectations,
• adequate time,
• consistent opportunities to learn, and
• strong support

that enable students to be mathematically successful.

Principles to Action, NCTM, 2014
Growth Mindset

In a growth mindset, people believe that their most basic abilities can be developed through dedication and hard work – brains and talent are just the starting point. This view creates a love of learning and a resilience that is essential for great accomplishment.

Mindset, Carol S. Dweck Ph.D., 2006, Random House Publishing
Instructional Practices

• We Ask
  – Implement tasks that promote reasoning and problem solving.

• We Listen
  – Facilitate meaningful mathematical discourse.
  – Pose purposeful questions.
  – Support productive struggle.

• We Learn
  – Elicit and use evidence of student thinking.

Principles to Action, NCTM, 2014
A Problem

While talking with a student…

\[
\begin{align*}
3 \times 7 & = 21 \\
4 \times 8 & = 32
\end{align*}
\]

The student noticed that each number in the second problem was an increase of 1 from the first problem. She wondered if that was going to happen all the time or if there were other problems for which it also was true.
Questions

• Are there other problems like this one?
• What generalizations can be made from this student’s observation?
• What do you know for sure?
• What do you want to know that you don’t?
• What are you wondering?
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Principles to Action, NCTM, 2014
## Another Problem

<table>
<thead>
<tr>
<th>The 9s…</th>
<th>The 8s…</th>
<th>The 7s…</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 9 = 9</td>
<td>1 x 8 = 8</td>
<td>1 x 7 = 7</td>
</tr>
<tr>
<td>2 x 9 = 18</td>
<td>2 x 8 = 16</td>
<td>2 x 7 = 14</td>
</tr>
<tr>
<td>3 x 9 = 27</td>
<td>3 x 8 = 24</td>
<td>3 x 7 = 21</td>
</tr>
<tr>
<td>4 x 9 = 36</td>
<td>4 x 8 = 32</td>
<td>4 x 7 = 28</td>
</tr>
<tr>
<td>5 x 9 = 45</td>
<td>5 x 8 = 40</td>
<td>5 x 7 = 35</td>
</tr>
<tr>
<td>6 x 9 = 54</td>
<td>6 x 8 = 48</td>
<td>6 x 7 = 42</td>
</tr>
<tr>
<td>7 x 9 = 63</td>
<td>7 x 8 = 56</td>
<td>7 x 7 = 49</td>
</tr>
<tr>
<td>8 x 9 = 72</td>
<td>8 x 8 = 64</td>
<td>8 x 7 = 56</td>
</tr>
<tr>
<td>9 x 9 = 81</td>
<td>9 x 8 = 72</td>
<td>9 x 7 = 63</td>
</tr>
</tbody>
</table>
Questions

We all know the 9’s trick….

• What is the 8’s trick?
• How is it related to the 9’s trick?
• What about a 7’s trick? A 6’s trick?
• What is going on and can we make a generalization?
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Principles to Action, NCTM, 2014
The Routine of Questions

• What pattern, rule or relationship seems to be true? Is it true for all cases?

• How are things changing? What steps are repeating?

• What operation shortcuts could be useful?

• How can I describe the rule or relationship?

• How can I “undo” or reverse the process?

• What generalization describes the pattern?
Final Thoughts…

• Curiosity is a driver of motivation – how you pose tasks can ignite curiosity

• Look for tasks that:
  – Focus on rigorous math
  – Are equitable and accessible
  – Promote struggle
  – Have more than one avenue to explore
  – Are open to exploration
Thank You

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